

Pillar 3 Disclosure Report of Clearstream Group

Disclosure as of 31 December 2019

Pillar 3 Disclosure Report of Clearstream Group 2019 – According to Part 8 of the Regulation (EU) No. 575/2013 (Capital Requirements Regulation, CRR) in conjunction with § 26a German Banking Act (Kreditwesengesetz, KWG).

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Part 8 CRR - Disclosure Overview

Requirement outlined in CRR article:	Reference sections in CH Pillar 3 Report 2019
<i>Title I. General Principles</i>	
Article 431. Scope of disclosure requirements	1.1.1 Objective of the report (Article 431 & 432 CRR)
Article 432. Non-material, proprietary or confidential information	1.1.1 Objective of the report (Article 431 & 432 CRR)
Article 433. Frequency of disclosure	1.1.3. Frequency and means of Disclosure (Article 433, 434 & 450 CRR)
Article 434. Means of disclosures	1.1.3. Frequency and means of Disclosure (Article 433, 434 & 450 CRR)
<i>Title II. Technical criteria on transparency and disclosure</i>	
Article 435. Risk management objectives and policies	
Article 435 (1)(a) the strategies and processes to manage those risks	4.1.1. Risk strategy (Article 435 (1)(a) CRR) 5.1. Strategy and process (Article 435 (1)(a) CRR) 6.1. Strategy and process (Article 435 (1)(a) & Article 454 CRR) 7.1. Strategy and process (Article 435 (1)(a) CRR) 8.1. Strategy and processes (Article 435 (1)(a) CRR)
Article 435 (1)(b) the structure and organisation of the relevant risk management function including information on its authority and statute, or other appropriate arrangements	5.2. Structure and organisation (Article 435 (1)(b) CRR) 6.2. Structure and organisation (Article 435 (1)(b) CRR) 7.2. Structure and organization (Article 435 (1)(b) CRR) 8.2. Structure and organisation (Article 435 (1)(b) CRR)
Article 435 (1)(c) the scope and nature of risk reporting and measurement systems	5.3. Assessment (Article 435 (1)(c) CRR) 6.3. Assessment (Article 435 (1)(c) CRR) 7.3. Assessment (Article 435 (1)(c) CRR) 8.3. Assessment (Article 435 (1)(c) CRR)
Article 435 (1)(d) the policies for hedging and mitigating risk, and the strategies and processes for monitoring the continuing effectiveness of hedges and mitigants	5.4. Mitigation and control (Article 435 (1)(d) & 453 CRR) 6.4. Mitigation and control (Article 435 (1)(d) CRR) 7.4. Mitigation and control (Article 435 (1)(d) CRR) 8.4. Mitigation and control (Article 435 (1)(d) CRR)
Article 435 (1)(e) a declaration approved by the management body on the adequacy of risk management arrangements of the institution providing assurance that the risk management systems put in place are adequate with regard to the institution's profile and strategy	4.1.5.5. Risk monitoring and reporting (Article 435 (1)(e))
Article 435 (1)(f) a concise risk statement approved by the management body succinctly describing the institution's overall risk profile associated with the business strategy. This statement shall include key ratios and figures providing external stakeholders with a comprehensive view of the institution's management of risk, including how the risk	4.1.6. Concise Risk Statement (Article 435 (1)(f) CRR)

profile of the institution interacts with the risk tolerance set by the management body.	
Article 435 (2)(a) the number of directorships held by members of the management body	3. Governance arrangements (Article 435 (2) CRR) 3.1. Clearstream Banking S.A. 3.2. Clearstream Banking AG 3.3. Clearstream Holding AG
Article 435 (2)(b) the recruitment policy for the selection of members of the management body and their actual knowledge, skills and expertise	3. Governance arrangements (Article 435 (2) CRR) 3.1. Clearstream Banking S.A. 3.2. Clearstream Banking AG 3.3. Clearstream Holding AG
Article 435 (2)(c) the policy on diversity with regard to selection of members of the management body, its objectives and any relevant targets set out in that policy, and the extent to which these objectives and targets have been achieved	3. Governance arrangements (Article 435 (2) CRR) 3.1. Clearstream Banking S.A. 3.2. Clearstream Banking AG 3.3. Clearstream Holding AG
Article 435 (2)(d) whether or not the institution has set up a separate risk committee and the number of times the risk committee has met	3. Governance arrangements (Article 435 (2) CRR) 3.1. Clearstream Banking S.A. 3.2. Clearstream Banking AG 3.3. Clearstream Holding AG
Article 435 (2)(e) the description of the information flow on risk to the management body	3. Governance arrangements (Article 435 (2) CRR) 3.1. Clearstream Banking S.A. 3.2. Clearstream Banking AG 3.3. Clearstream Holding AG
Article 436. Scope of application	1.1.2. Scope of application (Article 436 CRR)
Article 437. Own Funds	2.1. Capital components (Article 437 (1) CRR)
Article 438. Capital requirements	
Article 438 (1)(a) a summary of the institution's approach to assessing the adequacy of its internal capital to support current and future activities	4.1.1 Risk strategy (Article 435 (1)(a) CRR)
Article 438 (1)(c) the risk- weighted exposure amounts for each of the exposure classes specified in Article 112	252.2.1. Capital requirements for credit risk positions (Article 438 (1)(c) CRR)
Article 438 (1)(e) own funds requirements calculated in accordance with points (b) and (c) of Article 92(3)	2.2.3. Capital requirements for market risk positions (Article 438 (1)(e) CRR)
Article 438 (1)(f) own funds requirements calculated in accordance with Part Three, Title III, Chapters 2, 3 and 4 and disclosed separately	2.2.4. Capital requirements for operational risk (Article 438 (1)(f) CRR)

Article 439. Exposure to counterparty credit risk	5.10. Disclosure of counterparty credit risk (CCR) (Article 439 CRR)
Article 440. Capital buffers	2.3. Countercyclical capital buffer (Article 440 CRR) Annex 2. (Article 440 CRR)
Article 441. Indicators of global systemic importance	n/a
Article 442. Credit risk adjustments	5.9. Disclosure on credit risk exposures (Article 442, 444, 453 (f) CRR)
Article 443. Unencumbered assets	5.12. Asset encumbrance (Article 443 CRR)
Article 444. Use of ECAs	5.9. Disclosure on credit risk exposures (Article 442, 444, 453 (f) CRR)
Article 445. Exposure to market risk	7.6. Disclosure exposures for market risk (Article 445 CRR)
Article 446. Operational risk	6.6.6. Disclosure on operational risk (Article 446 CRR)
Article 447. Exposures in equities not included in the trading book	5.11. Disclosure of equities not included in the trading book (Article 447 CRR)
Article 448. Exposure to interest rate risk on positions not included in the trading book	7.7. Disclosure exposures on interest rate risk on positions not included in the trading book (Article 448 CRR)
Article 449. Exposure to securitisation positions	n/a
Article 450. Remuneration policy	1.1.3. Frequency and means of Disclosure (Article 433, 434 & 450 CRR)
Article 451. Leverage	2.4. Leverage ratio (Article 451 CRR)
<i>Title III. Qualifying requirements for the use of particular instruments or methodologies</i>	
Article 452. Use of the IRB Approach to credit risk	n/a
Article 453. Use of credit risk mitigation techniques	5.4. Mitigation and control (Article 435 (1)(d) & 453 CRR) 5.9. Disclosure on credit risk exposures (Article 442, 444, 453 (f) CRR)
Article 454. Use of the Advanced Measurement Approaches to operational risk	6.1. Strategy and process (Article 435 (1)(a) & Article 454 CRR)
Article 455. Use of Internal Market Risk Models	n/a

Table 1. Part 8 CRR - Disclosure Overview

1. Introduction

1.1. Regulatory framework

In 2004, the Basel Committee on Banking Supervision (“BCBS”) published its standards governing the capital adequacy of internationally active banks (“Basel II”). The Basel framework consists of three mutually reinforcing pillars, as outlined below.

- Pillar 1 concerns the minimum quantitative (capital) requirements related to credit, operational and market risks. In addition, when the Basel III framework was translated into European law, requirements to calculate a Leverage Ratio as well as Liquidity Coverage Ratio and Net Stable Funding Ratio came into force.
- Pillar 2 requires banks to integrate the risks of Pillar 1 and further significant and substantial risks into integrated capital management and risk management considerations. Additionally, the interaction between the banks’ own assessments and the banking supervisors’ review is prescribed.
- Pillar 3 promotes market discipline through disclosure and thereby transparency to the public.

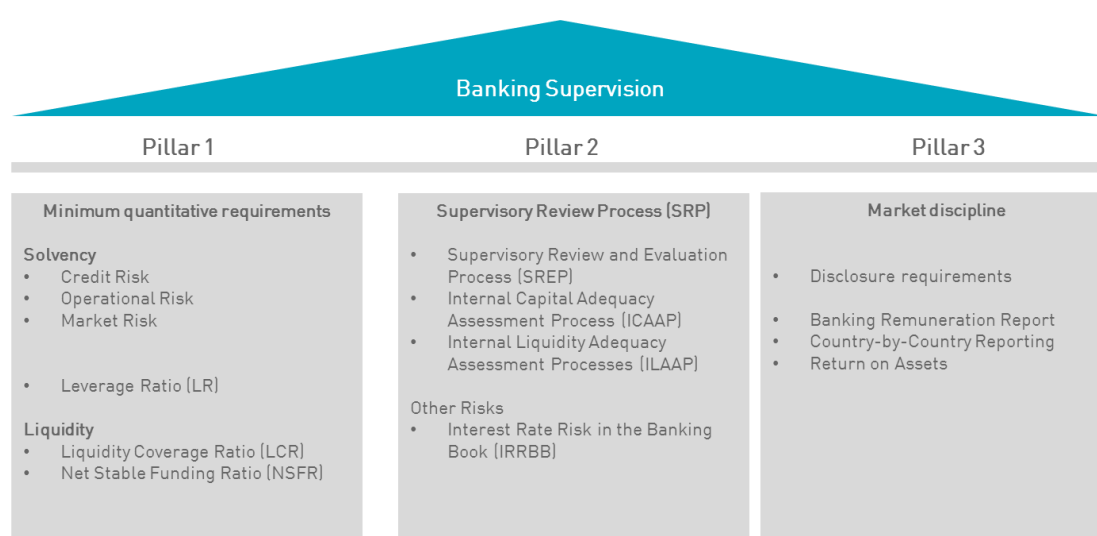


Figure 1. Overview of Regulatory Framework

In December 2010, BCBS published its revised regulatory banking framework commonly known as “Basel III”¹, which is an internationally agreed set of measures to strengthen the regulation, supervision and risk management of banks. The Basel III framework is translated into European law through Regulation (EU) No 575/2013 of the European Parliament and the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms (“CRR”) and Directive No 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms (“CRD IV”). The requirements outlined in Articles 89 to 96 CRD IV have been transposed into German law in § 26a KWG.

Furthermore, modified, as well as new disclosure requirements, have been outlined in the revised banking package in the form of the amended Capital Requirements Regulation (“CRR II”) and Capital Requirements Directive (“CRD V”) where the later one, however, still needs to be transposed into national law. These new disclosure requirements take effect on 28 June 2021.

In addition to the previously mentioned regulation and directives, this report considers the following regulatory publications:

- Commission Implementing Regulation (EU) No 1423/2013 of 20 December 2013 laying down implementing technical standards with regard to disclosure of own funds requirements for institutions according to Regulation (EU) No 575/2013 of the European Parliament and Council

¹ The main documents of this package are: “Basel III: A global regulatory framework for more resilient banks and banking systems”: <http://www.bis.org/publ/bcbs189.htm>, “Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools”: <http://www.bis.org/publ/bcbs238.pdf> and “Basel III: The net stable funding ratio”: <http://www.bis.org/bcbs/publ/d295.pdf>

- Commission Implementing Regulation (EU) No 2016/200 of 15 February 2016 laying down implementing technical standards with regard to disclosure of the leverage ratio for institutions, according to Regulation (EU) No 575/2013 of the European Parliament and of the Council
- Commission Delegated Regulation (EU) No 2015/1555 of 28 May 2015 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards for the disclosure of information in relation to the compliance of institutions with the requirement for a countercyclical capital buffer in accordance with Article 440
- Commission Delegated Regulation (EU) No 2017/2295 of 4 September 2017 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards for disclosure of encumbered and unencumbered assets

In the following, we refer to the respective laws in place as of 31 December 2019 if not stated otherwise.

1.1.1. Objective of the report (Article 431 & 432 CRR)

The objective of this Disclosure Report is to fulfil the disclosure requirements detailed in Part 8 CRR and § 26a KWG for Clearstream Holding AG (“CH”). More specifically, the report intends to provide a detailed overview on Clearstream Holding Group’s (“Clearstream Group”, “Clearstream”, “CH-Group”)

- Legal structure
- Capital structure
- Risk management framework including governance arrangements, risk management methodology and risk reporting
- Risk management in terms of identified risk types

Disclosure content can be omitted according to Article 432 CRR and relating EBA Guideline 2014/141 if the information is non-material, proprietary or confidential. To ensure adequate fulfilment of the disclosure requirements and assessing the appropriateness of the disclosed information, a *Disclosure Policy* has been established, which is reviewed and adapted, where necessary, on a yearly basis. The Executive Board of CH is ultimately responsible for the *Disclosure Policy* and must approve any material changes to the policy. The policy defines disclosure content, allocates responsibilities and defines disclosure processes and timelines.

In line with the *Disclosure Policy*, a dedicated process has to be followed in case Clearstream Group considers to omit certain disclosures due to these disclosures being immaterial, proprietary or confidential. Where the Group classifies information as non-material in this report, this has been stated accordingly in the related disclosures.

1.1.2. Scope of application (Article 436 CRR)

The figures for Clearstream Holding Group follow the consolidation provisions set out in Article 18 to 24 CRR in combination with the rules of § 10a (4) KWG and the German Generally Accepted Accounting Principles (German GAAP), based on the German Commercial Code (Handelsgesetzbuch, HGB). As all Clearstream companies - regardless of accounting and/or regulatory consolidation - are included in the consolidated annual accounts/annual report of the ultimate parent company Deutsche Börse AG (“DBAG”), CH is, according to § 291 of HGB, exempted from the obligation to draw up consolidated statutory accounts. Consolidated financial figures are therefore set up for regulatory purposes only.

All disclosed information is reported in CH’s accounting and reporting currency, Euro, if not otherwise specified.

1.1.3. Frequency and means of Disclosure (Article 433, 434 & 450 CRR)

In accordance with Article 434 CRR, CH publishes its Disclosure Report on its website:

<https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report>

The report is updated once a year. In addition to the Pillar 3 report, the following documents are also made available:

- A remuneration report that fulfils the requirements according to Article 450 CRR. The report is disclosed on an annual basis on the website of Clearstream Group: www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/remuneration-information

- The Country-by-Country reporting to fulfil the requirements according to § 26a (1) sentence 2 KWG (implementation of Article 89 CRD IV into German law) is included as an annex to the financial statements of Clearstream Holding AG and that is published on the website of the German Federal Gazette (www.bundesanzeiger.de) and that can also be found on the website of Clearstream: <https://www.clearstream.com/clearstream-en/about-clearstream/reports-and-ratings/annual-reports>
- Information about the Return on Assets ("RoA") according to § 26a (1) sentence 4 KWG (implementation of Article 90 CRD IV into German law) is disclosed in the management report of the financial statement of CBF. CBL disclosed the RoA according to Article 38-4 of the Luxembourg Banking Act under note 9.3 in the notes to its financial statements. The financial statement of CBF is published on the website of the German Federal Gazette (www.bundesanzeiger.de). The financial statements of CBL are published the Luxembourg Trade and Companies Register (Registre de Commerce et des Sociétés). The information can also be found on the website of Clearstream: <https://www.clearstream.com/clearstream-en/about-clearstream/reports-and-ratings/annual-reports>

1.2. Clearstream Group (Article 436 CRR)

CH was founded under the name Deutsche Börse Verwaltungs AG on 4 June 2007 in Frankfurt/Main. On 12 May 2009 the company was officially renamed Clearstream Holding AG, Frankfurt/Main. CH is headquartered in Germany and has its registered office at Mergenthalerallee 61, 60485 Frankfurt am Main, Germany.

In the context of the corporate restructuring of Clearstream, CH acquired an additional company called Skylinehöhe 96 VV AG in December 2018. It was renamed into Clearstream Beteiligungs AG ("CBAG") effective as of 2 January 2019. Most of Clearstream Group's participations were transferred from Clearstream International S. A. ("CI") to Clearstream Participations S. A. ("CP"). Effective from 1 July 2019 CP itself was merged with CBAG (the former Skylinehöhe 96 VV AG). On 12 November 2019, CH was merged into CBAG and renamed to CH.

Clearstream Holding AG is licensed as a financial holding company as defined in Article 4 paragraph 1 No 20 CRR and, together with its subordinated companies, amongst others Clearstream Banking S.A., Luxembourg ("CBL") and Clearstream Banking AG, Frankfurt/Main ("CBF"), forms a financial holding group under German law.

1.2.1. Corporate structure

CH and its subsidiaries are mainly, directly or indirectly, fully owned by Deutsche Börse AG (“DBAG”). The ownership structure of Clearstream Group as part of DBAG is shown in Figure 2.

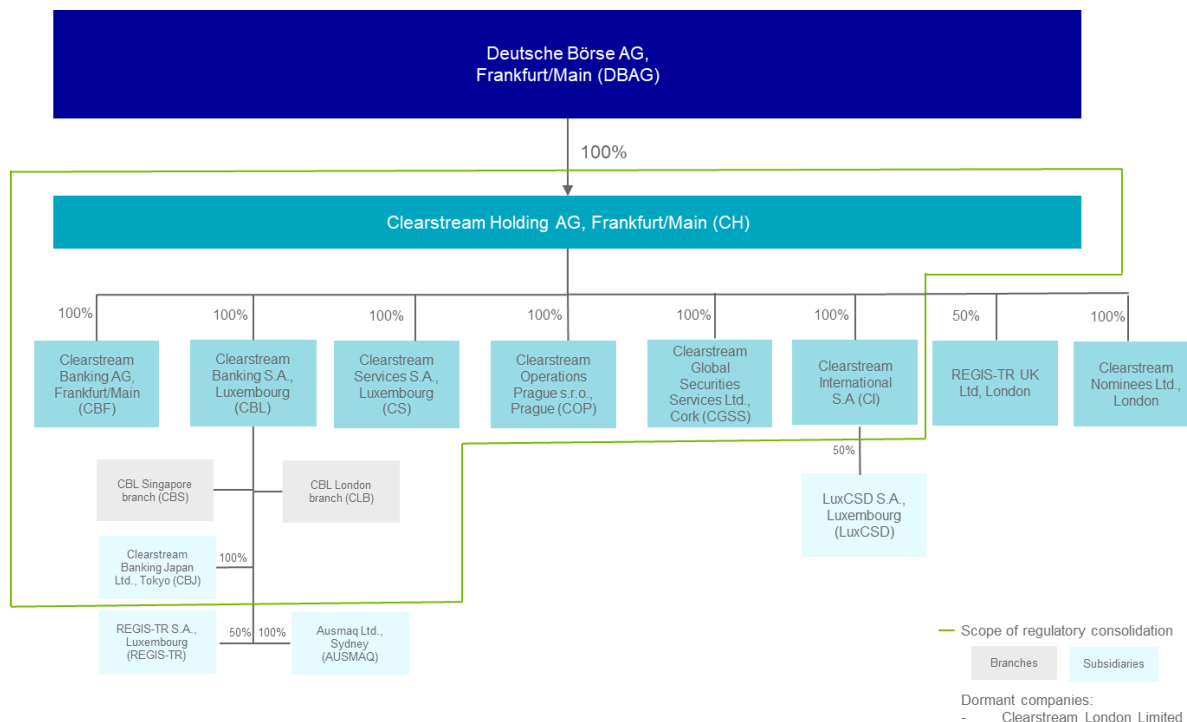


Figure 2. Overview of Corporate Structure

1.2.2. Business operations

Clearstream Group is a post-trade services provider and has been fully owned by DBAG since July 2002.

Clearstream Group’s main business activities are custody and settlement of securities and can be further divided into:

- Domestic central securities depository business (“CSD”) and
- International central securities depository business (“ICSD”).

In terms of the domestic business, Clearstream Banking AG (“CBF”) acts as the central securities depository for the German market according to the German Securities Deposit Act (“Depotgesetz”), while Clearstream Banking S.A. (“CBL”) is only involved marginally in domestic CSD activities for Luxembourg securities.

The ICSD business, however, is mostly performed by CBL. More specifically, the ICSD business provides different types of settlement options to facilitate the settlement of transactions in international and domestic securities traded across borders, depending on the selected settlement location. CBF internationally only covers the services offered for Non-Collective Safe Custody business (“NCSC”), that is, book-entry credits on a fiduciary basis or trustee business.

Besides the afore-mentioned business activities, Clearstream also offers securities lending services, collateral management, banking services and Liquidity Hub Global Outsourcing (all included in the Global Securities Financing (“GSF”)) as well as Investment Fund Services (including order routing) which are all linked to its main business activities custody and settlement. In addition, Clearstream offers IT outsourcing for third parties via its subsidiary Clearstream Services S.A.

Further information on the business activities per entity is provided below.

1.2.2.1. Clearstream Holding AG, Frankfurt / Main (“CH”)

CH is classified as a financial holding company according to Article 4 paragraph 1 No 20 CRR.

CH acts solely as a holding company in the interest of its subsidiaries and does not have material additional business activities and therefore risk positions. Moreover, CH is the superordinated undertaking of the

financial holding group according to § 10a (1) KWG. CH in its role is responsible to fulfil the regulatory obligations on a consolidated/group level towards the German supervisory authorities and the college of supervisors.

1.2.2.2. Clearstream International S.A., Luxembourg (“CI”)

CI is defined as an ancillary services undertaking in accordance with Article 4 paragraph 1 point 18 CRR. Following the recent CH-Group restructuring, CI only holds one participation, i.e. 50% of the shares in LuxCSD S.A. CI's main business activities lie within its role as trustee providing operational support for ASL and ASLplus business. CI is authorized in Luxembourg as a specialized PSF (professional depository of financial instruments) according to article 26 of the Luxembourg Law of 5 April 1993 on the financial sector, as amended.

1.2.2.3. Clearstream Banking S.A., Luxembourg (“CBL”)

CBL is defined as a credit institution in accordance with Article 4 paragraph 1 No 1 CRR. CBL was incorporated in 1970 and is an ICSD which provides settlement and custody services for international securities.

These services include:

- Delivery versus payment and delivery free of payment settlement transactions;
- Comprehensive custody management;
- Value-added services, such as securities lending, collateral management etc.;
- Transactional information distribution.

Further services offered by CBL include the issuance of securities, Investment Funds Services (“IFS”) and Global Securities Financing (“GSF”), consisting of securities lending as well as collateral management services. In addition, CBL provides operative treasury services for CBF as well as for CI and Clearstream Services S.A. (“CS”).

In May 2019, CBL launched an enhanced distribution support service – called Fund Desk – for all its customers.

Additionally, CBL applied for an authorisation as CSD according to Article 17 for providing banking-type ancillary services according to Article 54 paragraph 2 lit. (a) of Regulation (EU) No 909/2014 (“Central Securities Depositories Regulation”, “CSDR”). The authorisation is expected to be provided in spring 2021.

CBL holds the following branches/participations:

CBL Singapore branch (“CBS”)

CBS is a branch of CBL and its first operational centre outside Europe. In November 2009, the Singapore branch obtained a banking license, which has been updated in October 2017. All of CBL's products and services, including Global Securities Financing, Investment Funds Services and Issuance and Distribution are offered locally to customers in the Asia-Pacific region.

CBL London branch (“CLB”)

In January 2016, Clearstream transformed its representative office in London into a fully established branch, which took over the activities of the representative office.

Clearstream Banking Japan Ltd, Tokyo (“CBJ”)

In 2009, CBL established a fully owned subsidiary in Tokyo, Japan. The purpose of Clearstream Banking Japan Ltd (“CBJ”) is to engage in marketing, information provision and advertising; holding financial seminars and other education and trainings; support of existing customers of group companies and any other business activities relating to any of the preceding.

Clearstream London Limited (“CLL”)

On 27 December 2018 CBL established a fully owned subsidiary called Clearstream London Limited (“CLL”) in London, UK. CLL is a dormant entity that has submitted an application for an Arranger licence to the Financial Conduct Authority. CLL considers that the Arranger licence is sufficient to cover the full extent of

its UK based activity, which therefore represents a viable contingency path at the conclusion of the temporary permissions regimes under which it intends to operate in the period following exit day.

Regis-TR S.A., Luxembourg (“REGIS-TR”)

REGIS-TR S.A. is a public limited liability company (“société anonyme”) organised and existing under the laws of Luxembourg. The Company was launched on 9 December 2010 by the Spanish Central Securities Depository, Sociedad de Gestión de los Sistemas de Registro, Compensación y Liquidación de Valores, S.A. and Clearstream Banking S.A. as 50/50 joint venture, and is headquartered in the Grand Duchy of Luxembourg, with a branch in Madrid.

REGIS-TR is a European Trade Repository (TR) for reporting trades and transactions across multiple product classes and jurisdictions. The TR is open to financial and non-financial institutions, and services the major regulatory reporting obligations in Europe.

REGIS-TR collects and administers details of derivative trades and transactions reported by its customers (market participants) in order to give its customers and regulators an aggregated view of positions in compliance with the relevant regulations.

REGIS-TR has been registered by the European Markets and Securities Authority (ESMA) on 14 November 2013 in accordance with Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories (European Market Infrastructure Regulation), for the provision of reporting services commonly referred to as “EMIR”.

In addition, REGIS-TR was recognised by the Swiss Financial Market Supervisory Authority (FINMA) on 1 April 2017 as a foreign trade repository in accordance with Article 80 FMIA for the receipt of reports about derivatives transactions from persons subject to reporting requirements in accordance with Article 104 FMIA and Article 105 paragraph 2 FMIA in conjunction with Article 93 FMIO, for the provision of reporting services commonly to as “FinfraG”.

In addition to its existing core services, REGIS-TR is progressing well towards its goal of becoming a one-stop-shop for regulatory reporting requirements and has developed its Securities Financing Transaction Reporting service which is expected to enter into force on 11 April 2020. REGIS-TR applied to ESMA for a service extension enabling it to perform Trade Repository services pertaining to the Securities Finance Transaction Reporting regulation 2015/2365 of 25 November 2015 (SFTR).

Since 2010, REGIS-TR is fully consolidated in the DB Group financial statements. With regard to the consolidation provisions set out in the CRR/KWG, REGIS-TR has been classified as an “other undertaking” and is therefore not included in regulatory consolidation.

Ausmaq Limited, Sydney (“Ausmaq”)

Clearstream Banking S.A. successfully completed the acquisition of Ausmaq Limited, Sydney, Australia, during the third quarter of 2019. With this acquisition, Clearstream is further expanding its offering in the investment funds space and has entered the Australian market. Ausmaq Limited has been a wholly owned subsidiary of Clearstream Banking Luxembourg since 31 July 2019.

1.2.2.4. Clearstream Banking AG, Frankfurt / Main (“CBF”)

CBF is defined as a credit institution in accordance with Article 4 paragraph 1 No 1 CRR. CBF is a CSD, which provides settlement and custody services in both, the Collective Safe Custody (“CSC”), which is mainly German domestic, and the Non-Collective Safe Custody businesses. The focus of the settlement business is thereby on the settlement of stock exchange transactions.

CBF is the only CSD in Germany. It operates a large vault where most of the securities issued in Germany, securities issued elsewhere, as well as physical gold are stored. Within the frame of individual or collective safe custody, the settlement and asset servicing of domestic and international securities are offered.

These services include:

- Delivery versus payment and delivery free of payment settlement transactions;
- Comprehensive custody management;
- Value-added services like securities lending, collateral management etc.;
- Transactional information distribution.

Beyond that, CBF acts as a trustee to cover specific types of asset-backed bonds. With respect to commodity-backed bonds, the commodity (Gold) is stored physically in the vaults of CBF. For bond issues covered by

securities, CBF, as a Central Securities Depository, performs safekeeping's and as a trustee offers an increased level of protection for investors with significantly low-risk businesses and operational models. Moreover, CBF offers its customers the Global Securities Financing (GSF) service, through which market participants can lend and borrow securities against collateral.

Additionally, CBF applied for an authorisation as CSD according to Article 17 of Regulation (EU) No 909/2014 ("Central Securities Depositories Regulation", "CSDR"), for which authorization has been granted on 21 January 2020. Additionally, CBF will apply for an authorization for providing banking-type ancillary services according to Article 54 paragraph 2 lit. a CSDR and authorization is expected in Q1 2021.

1.2.2.5. Clearstream Services S.A., Luxembourg ("CS")

CS is defined as an ancillary services undertaking in accordance with Article 4 paragraph 1 No 18 CRR. CS provides information technology managed and application service provision. The company's services include hosting, network management, system management, security management, storage and data management, information technology operations, and disaster recovery planning, as well as consultancy, project management, and quality assurance services. It serves financial market customers in Luxembourg and internationally. The company was founded in 1997 and is based in Luxembourg. Main services are provided to CBL and CBF. In addition, CS provides services to external customers.

1.2.2.6. Clearstream Operations Prague s. r. o., Prague ("COP")

COP is defined as an ancillary services undertaking in accordance with Article 4 paragraph 1 No 18 CRR. In 2008 CI established a subsidiary in Prague, Czech Republic. Clearstream Operations Prague s. r. o. ("COP") offers certain operational services in relation to CBL, CBF, and LuxCSD. Furthermore, COP functions as a shared services centre for certain administrative and support functions for major parts of the entire Deutsche Börse Group. After the restructuring of Clearstream Group COP operates as a direct subsidiary of CH.

As the arrangements are governed by outsourcing contracts according to Luxembourg and German regulatory standards, the services performed are fully monitored and managed by Clearstream management structures and processes.

1.2.2.7. Clearstream Global Securities Services Ltd, Cork ("CGSS")

CGSS is defined as an ancillary services undertaking in accordance with Article 4 paragraph 1 No 18 CRR. CGSS is a wholly owned subsidiary of CH and is one of Clearstream's servicing centres for mutual and hedge funds, as well as core client services support. CGSS also provides corporate IT support services for DB Group entities.

1.2.2.8. LuxCSD S.A., Luxembourg ("LuxCSD")

As a central securities depository, LuxCSD provides Luxembourg's financial community with services for settlement in EUR central bank money as well as with issuing and custody services for a wide variety of domestic and international securities including investment funds. LuxCSD was incorporated in July 2010 and is jointly owned by the Banque centrale du Luxembourg (BCL) and CI (equal shares; 50%/50%).

Additionally, LuxCSD applied for an authorisation as CSD according to Article 17 of Regulation (EU) No 909/2014 ("Central Securities Depositories Regulation", "CSDR"). Authorisation has been granted on 15 April 2020.

1.2.3. Licencing and regulatory supervision

As of 1 January 2018, Clearstream Banking S.A. is classified as Other Systemically Important Institution ("O-SII") as per CSSF Regulation N° 18-06 since the competent authorities comply with the EBA Guidelines 2014/10 on criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD IV) in relation to the assessment of other systemically important institutions. Due to its classification as an O-SII, CBL must produce a stand-alone Pillar 3 disclosure report.

Commission de Surveillance du Secteur Financier ("CSSF") is the competent authority for the supervision of CBL as a credit institution according to Article 42 and 43 of the Luxembourg Banking Act. Furthermore, Banque Centrale du Luxembourg ("BCL") has a shared responsibility for liquidity supervision on the basis of Article 2 (4) of the Law of 23 December 1998 concerning the monetary status.

Moreover, CBL is subject to regulatory supervision in relation to the securities settlement system (“SSS”) according to Title V of the Luxembourg Law of 10 November 2009 relating to payment services. BCL is responsible for the oversight of SSSs, as per Art. 110 of the Law of 10 November 2009. The oversight focuses on the operational and financial stability of each system individually, the participants in such systems as well as the stability of the financial system as a whole. Furthermore, specific regulations for SSSs must be considered (e.g. circulars BCL 2001/163 and 2001/168).

Clearstream Banking AG is a company incorporated in Germany and licensed as a credit institution under supervision of the German Financial Supervisory Authority (“Bundesanstalt für Finanzdienstleistungsaufsicht”, “BaFin”).

CBF accepts deposits and grants its clients short-term loans. It is therefore a CRR credit institution pursuant to section 1 (3d) of Kreditwesengesetz (KWG, German Banking Act).

Clearstream Holding as the superordinate company of the financial holding Group according to § 10a (1) KWG, is responsible for fulfilling the regulatory obligations on a consolidated/Group level vis-à-vis the German supervisory authorities and presents a Pillar 3 report in compliance with the disclosure requirements pursuant to Part Eight CRR and § 26a KWG.

CH is subject to consolidated supervision by the German Federal Financial Supervisory Authority.

1.2.4. Scope of consolidation

All information provided in this report refers if not stated otherwise to the companies included in the regulatory scope of consolidation. The regulatory scope of consolidated differs slightly from the consolidated group under accounting rules.

The following Table 2 shows both the scope of regulatory and accounting consolidation including the description of the type of the enterprise.

Type of enterprise	Company	Regulatory consolidation		Accounting consolidation	
		Consolidation Art. 18 CRR Full Consolidation	Deduction/ Higher Risk Weighting acc. Art. 48 CRR	Full Consolidation	At equity
Credit Institutions	Clearstream Banking S.A., Luxembourg (CBL)	X		X	
	Clearstream Banking AG, Frankfurt am Main (CBF)	X		X	
Financial Holding Company	Clearstream Holding AG, Frankfurt am Main (CH)	X			
Financial Institution	LuxCSD S.A. Luxembourg (LuxCSD) ¹		X		X
	Ausmaq Ltd., Sydney (AUSMAQ)		X	X	
Regulated Ancillary Services Undertaking	Clearstream Services S.A., Luxembourg (CS) ²	X		X	
	Clearstream Operations Prague s.r.o., Prague (COP)	X		X	
Ancillary Services Undertaking	Clearstream Banking Japan Ltd., Tokyo (CBJ)	X		X	
	Clearstream Global Securities Services Ltd., Cork (CGSS)	X		X	
Other Financial Undertaking	Clearstream International, S.A., Luxembourg (CI) ³	X		X	
	Clearstream Nominees Ltd., London		X		
	REGIS-TR S.A., Luxembourg (REGIS-TR) ³		X	X	
	REGIS-TR UK Ltd., London		X	X	

¹ PSF according to Article 26 of the Luxembourg Law of 5 April 1993;

² PSF according to Articles 29-2 and 29-4 of the Luxembourg Law of 5 April 1993;

³ REGIS-TR is classified as trade repository according to Article 2 paragraph 2 EMIR.

Table 2. Regulatory and Accounting Scope of Consolidation

The assignment of the companies to the types of enterprise is based on the definitions contained in Art. 4 CRR. Clearstream has no company that was consolidated proportionately at the reporting date.

2. Capital structure, capital ratio and leverage ratio

In all the tables shown in this chapter, the data for CH-Group and CBF is based on the German GAAP according to the German Commercial Code (HGB). The data for CBL is based on International Financial Reporting Standards (IFRS).

2.1. Capital components (Article 437 (1) CRR)

The following subsections disclose the information as required by Article 437 paragraph 1 CRR and details set out in Commission Implementing Regulation (EU) No 1423/2013.

2.1.1. Overview

The following [Table 3](#) summarizes the total amount of Clearstream's regulatory own funds. "Tier 1" capital in 2019 corresponds to Core Equity Tier 1 (CET1) capital according to Article 26 CRR.

			31 December 2019 (€' 000)			31 December 2018 (€' 000)		
			CH-Group	CBL	CBF	CH-Group	CBL	CBF
Tier 1:	Eligible Capital	Paid up capital	50	92,000	25,000	101,000	92,000	25,000
		Share premium	0	229,935	1,108	2,014,314	136,836	1,108
	Eligible Reserves	Reserves	1,786,256	937,887	245,892	-724,965	920,164	343,461
		Interim profits	-121,912	-512	97,776	169,309	-	-
	Deductions:		-104,888	-109,950	-80	-34,193	-37,009	-264
Tier 2:	Core additional own funds	Revaluation reserves	-	-	-	-	-	-
		Subordinated Loan Capital	-	-	-	-	-	-
		Fixed-term cumulative	-	-	-	-	-	-
		Deductions:	-	-	-	0	0	0
	Eligible own funds:		1,559,506	1,149,360	369,696	1,525,464	1,111,991	369,306

Table 3. Composition of Regulatory Capital

Tier 1 capital consists of subscribed capital, reserves and funds for general banking risk. Losses reduce the retained earnings and therefore the Tier 1 capital. Deductions of core capital arise from intangible assets. Due to the restructuring which took place during 2019, years end figures of 2019 cannot be comprehensively compared to years end figures of 2018.

The following subsections disclose the information as required by Article 437 paragraph 1 CRR and details set out in Commission Implementing Regulation (EU) No 1423/2013.

2.1.1.1. Reconciliation of own funds items to audited financial statements (Article 437 (1)(a) CRR)

A full reconciliation of own funds to audited financial statements pursuant to point (a) of Article 437 paragraph 1 CRR must be applied by institutions as laid out in the Implementing Regulation (EU) No 1423/2013. As CH is exempted from the preparation of consolidated annual accounts in line with § 291 (1) HGB a reconciliation with consolidated own funds is not possible. The balance sheet reconciliation for CBL and CBF is shown in [Table 4](#).

	31 December 2019 (€' 000)		31 December 2018 (€' 000)	
	CBL	CBF	CBL	CBF
Own Funds elements in the Annual Financial Statements				
Subscribed Capital	92,000	25,000	92,000	25,000
Share premium	229,935	1,108	136,836	1,108
Accumulated other comprehensive income	-1,691	0		
Legal Reserve	9,200	1,392	0	0
Other reserves and retained earnings	930,363	342,276	920,164	343,461
Profits for the financial year and accumulated profits	279,096	0	0	0
Total Own Funds Elements in Audited Financial Statements	1,538,903	369,776	1,149,000	369,570
Profits allocated to other reserves with the approval of financial statements (i.e. after reporting of Own Funds)	-141		0	-
Profits for the financial year and accumulated profits (i.e. after reporting of Own Funds)	-279,096		0	-
Eligible Capital (CET1) before regulatory adjustments	1,259,666	369,776	1,149,000	369,570
Deduction other intangible assets	-92,247	-80	-12,422	-264
Other CET 1 capital adjustments	-18,059		-24,587	0
Common Equity Tier 1 Capital/Total Eligible Own Funds	1,149,360	369,696	1,111,991	369,306

Table 4. Balance Sheet Reconciliation

The own funds of the financial statements of the Clearstream entities consider profits allocated to retained earnings with the approval of the financial statements and year-end profits which both do not qualify for the regulatory own funds as of 31 December 2019. The profits allocated to retained earnings do not count as CET1 capital if the financial statements are not approved or a prior permission by the competent authority according to Article 26 paragraph 2 CRR is granted.

2.1.2. Description of the main features of capital instruments (Article 437 (1)(b) CRR)

Disclosures under point (b) of Article 437 CRR are shown in the next tables for CH, CBL and CBF in line with the disclosure templates set out in the Implementing Regulation (EU) No 1423/2013.

Capital Instruments' main features ⁽¹⁾		
	Features	Instrument
1	Issuer	Clearstream Holding AG
2	Unique identifier (e.g. ISIN, etc.)	N/A
3	Governing law(s) of the instrument	German Stock Corporation Act (AktG)
	Regulatory treatment	
4	Transitional CRR rules	Common Equity Tier 1
5	Post-transitional CRR rules	Common Equity Tier 1
6	Eligible at solo/ (sub-)consolidated/ solo & (sub-)consolidated	Consolidated
7	Instrument type (types to be specified by each jurisdiction)	Ordinary Shares
8	Amount recognised in regulatory capital (currency in million, as of most recent reporting date)	€ k 50
9	Nominal amount of instrument (in million, in currency of issuance)	€ k 50
9a	Issue price	€ k 50
9b	Redemption price	N/A
10	Accounting classification	Shareholders' equity
11	Original date of issuance	N/A
12	Perpetual or dated	perpetual
13	Original maturity date	N/A
14	Issuer call subject to prior supervisory approval	No
15	Optional call date, contingent call dates and redemption amount	N/A
16	Subsequent call dates, if applicable	N/A
	Coupons/dividends	
17	Fixed or floating dividend/coupon	Floating
18	Coupon rate and any related index	N/A
19	Existence of a dividend stopper	N/A
20a	Fully discretionary, partially discretionary or mandatory (in terms of timing)	Mandatory
20b	Fully discretionary, partially discretionary or mandatory (in terms of amount)	Mandatory
21	Existence of step up or other incentive to redeem	No
22	Noncumulative or cumulative	Noncumulative
23	Convertible or non-convertible	Nonconvertible
24	If convertible, conversion trigger(s)	N/A
25	If convertible, fully or partially	N/A
26	If convertible, conversion rate	N/A
27	If convertible, mandatory or optional conversion	N/A
28	If convertible, specify instrument type convertible into	N/A
29	If convertible, specify issuer of instrument it converts into	N/A
30	Write-down features	No
31	If write-down, write-down trigger(s)	N/A
32	If write-down, full or partial	N/A
33	If write-down, permanent or temporary	N/A
34	If temporary write-down, description of write-up mechanism	N/A
35	Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument)	N/A
36	Non-compliant transitioned features	No
37	If yes, specify non-compliant features	N/A

(1) 'N/A' inserted if the question is not applicable

Table 5. Capital Instruments Main Features (CH)

Capital Instruments' main features ⁽¹⁾

Features	Instrument
Issuer	Clearstream Banking SA
Unique identifier (e.g. ISIN, etc.)	N/A
Governing law(s) of the instrument	Luxembourg Company Law : Law of 10th August 1915 on commercial companies
Regulatory treatment	
Transitional CRR rules	Common Equity Tier 1
Post-transitional CRR rules	Common Equity Tier 1
Eligible at solo/ (sub-)consolidated/ solo & (sub-)consolidated	Solo
Instrument type (types to be specified by each jurisdiction)	Ordinary shares
Amount recognised in regulatory capital (currency in million, as of most recent reporting date)	€ m 229
Nominal amount of instrument (in million, in currency of issuance)	€ m 92
Issue price	€ m 229
Redemption price	N/A
Accounting classification	Shareholders' equity
Original date of issuance	1970
Perpetual or dated	perpetual
Original maturity date	N/A
Issuer call subject to prior supervisory approval	No
Optional call date, contingent call dates and redemption amount	N/A
Subsequent call dates, if applicable	N/A
Coupons/dividends	
Fixed or floating dividend/coupon	Floating
Coupon rate and any related index	N/A
Existence of a dividend stopper	No
Fully discretionary, partially discretionary or mandatory (in terms of timing)	Fully discretionary
Fully discretionary, partially discretionary or mandatory (in terms of amount)	Fully discretionary
Existence of step up or other incentive to redeem	No
Noncumulative or cumulative	Noncumulative
Convertible or non-convertible	Nonconvertible
If convertible, conversion trigger(s)	N/A
If convertible, fully or partially	N/A
If convertible, conversion rate	N/A
If convertible, mandatory or optional conversion	N/A
If convertible, specify instrument type convertible into	N/A
If convertible, specify issuer of instrument it converts into	N/A
Write-down features	No
If write-down, write-down trigger(s)	N/A
If write-down, full or partial	N/A
If write-down, permanent or temporary	N/A
If temporary write-down, description of write-up mechanism	N/A
Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument)	N/A
Non-compliant transitioned features	No
If yes, specify non-compliant features	N/A

¹ inserted if the question is not applicable

Table 6. Capital Instruments Main Features (CBL)

Capital Instruments' main features ⁽¹⁾

Features		Instrument
1	Issuer	Clearstream Banking Aktiengesellschaft
2	Unique identifier (e.g. ISIN, etc.)	DE0008053604
3	Governing law(s) of the instrument	German Stock Corporation Act (AktG)
Regulatory treatment		
4	Transitional CRR rules	Common Equity Tier 1
5	Post-transitional CRR rules	Common Equity Tier 1
6	Eligible at solo/ (sub-)consolidated/ solo & (sub-)consolidated	Solo
7	Instrument type (types to be specified by each jurisdiction)	Ordinary Shares
8	Amount recognised in regulatory capital (currency in million, as of most recent reporting date)	€ m 26
9	Nominal amount of instrument (in million, in currency of issuance)	€ m 25
9a	Issue price	€ m 26
9b	Redemption price	N/A
10	Accounting classification	Shareholders' equity
11	Original date of issuance	1949
12	Perpetual or dated	perpetual
13	Original maturity date	N/A
14	Issuer call subject to prior supervisory approval	No
15	Optional call date, contingent call dates and redemption amount	N/A
16	Subsequent call dates, if applicable	N/A
Coupons/dividends		
17	Fixed or floating dividend/coupon	Floating
18	Coupon rate and any related index	N/A
19	Existence of a dividend stopper	N/A
20a	Fully discretionary, partially discretionary or mandatory (in terms of timing)	Fully discretionary
20b	Fully discretionary, partially discretionary or mandatory (in terms of amount)	Fully discretionary
21	Existence of step up or other incentive to redeem	No
22	Noncumulative or cumulative	Noncumulative
23	Convertible or non-convertible	Nonconvertible
24	If convertible, conversion trigger(s)	N/A
25	If convertible, fully or partially	N/A
26	If convertible, conversion rate	N/A
27	If convertible, mandatory or optional conversion	N/A
28	If convertible, specify instrument type convertible into	N/A
29	If convertible, specify issuer of instrument it converts into	N/A
30	Write-down features	No
31	If write-down, write-down trigger(s)	N/A
32	If write-down, full or partial	N/A
33	If write-down, permanent or temporary	N/A
34	If temporary write-down, description of write-up mechanism	N/A
35	Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument)	N/A
36	Non-compliant transitioned features	No
37	If yes, specify non-compliant features	N/A

(1) 'N/A' inserted if the question is not applicable

Table 7. Capital Instruments Main Features (CBF)

2.1.3. Own fund details

The following tables summarise the total amount of the regulatory capital of CH-Group, CBL and CBF.

	31 December 2019 (€' 000)	(B) REGULATION (EU) No. 575/2013 ARTICLE REFERENCE
Common Equity Tier 1 capital: instruments and reserves		
1	50	26 (1), 27, 28, 29, EBA list 26 (3)
2	-121,912	26 (1) c)
3	1,786,256	26 (1)
6	1,664,394	
Common Equity Tier 1 capital: regulatory adjustments		
8	-104,888	36 (1) (b), 37
28	-104,888	
29	1,559,506	
45	1,559,506	
58	0	
59	1,559,506	
60	6,422,721	
Capital ratios and buffers		
61	24.28%	92 (2) (a)
62	24.28%	92 (2) (b)
63	24.28%	92 (2) (c)
64	7.02%	CRD 128, 129, 130, 131, 133
65	2.50%	
66	0.02%	
68	16.28%	CRD 128
Amounts below the thresholds for deduction (before risk weighting)		
73	33,779	36 (1) (i), 45, 48
Applicable caps on the inclusion of provisions in Tier 2		
77	9,850	62

Table 8. Own Funds Details (CH-Group)

	31 December 2019 (€' 000)	(B) REGULATION (EU) No. 575/2013 ARTICLE REFERENCE	
Common Equity Tier 1 capital: instruments and reserves			
1	Capital Instruments and Share premium	321,935	26 (1), 27, 28, 29, EBA list 26 (3)
	of which: Subscribed capital	92,000	EBA list 26 (3)
	of which: Share premium	229,935	EBA list 26 (3)
2	Retained Earnings	-512	26 (1) (c)
3	Accumulated other comprehensive income (and other reserves, to include unrealised gains and losses under the applicable accounting standards)	937,887	26 (1)
6	Common Equity Tier 1 (CET1) capital before regulatory adjustments	1,259,310	
Common Equity Tier 1 (CET1) capital: regulatory adjustments			
8	Intangible assets (net of related tax liability) (negative amount)	-93,430	36 (1) (b), 37, 472 (4)
27	Qualifying AT1 deductions that exceeds the AT1 capital of the institution (negative amount)	-16,520	36 (1) (j)
28	Total regulatory adjustments to Common Equity Tier 1 (CET1)	-109,950	
29	Common Equity Tier 1 (CET1) capital	1,149,360	
44	Additional Tier 1 (AT 1) capital	0	
45	Tier 1 capital (T1 = CET1 + AT1)	1,149,360	
58	Tier 2 (T2) capital	0	
59	Total capital (TC = T1 + T2)	1,149,360	
60	Total risk-weighted assets	4,720,932	
Capital ratios and buffers			
61	Common Equity Tier 1 capital ratio (as a percentage of risk exposure amount)	24.35%	92 (2) (a)
62	Tier 1 capital ratio (as a percentage of risk exposure amount)	24.35%	92 (2) (b)
63	Total capital ratio (as a percentage of risk exposure amount)	24.35%	92 (2) (c)
64	Institution specific buffer requirement (CET 1 requirement in accordance with Art. 92 (1) (a) plus capital conservation and countercyclical buffer requirements, plus systemic risk buffer, plus systemically important institution buffer expressed as a percentage of risk exposure amount)	3.04%	CRD 128, 129, 130, 131, 133
65	of which: capital conservation buffer requirement	2.50%	
66	of which: countercyclical buffer requirement	0.04%	
67	of which: systemic risk buffer requirement	0.50%	
68	Common Equity Tier 1 capital available to meet buffers (as a percentage of risk-exposure amount)	12.31%	CRD 128
Amounts below the thresholds for deduction (before risk weighting)			
72	Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount below 10 % threshold and net of eligible short positions)	5,558	36 (1) (h), 46, 45 56 (c), 59, 60 66 (c), 69, 70
73	Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount below 10 % threshold and net of eligible short positions)	31,646	36 (1) (i), 45, 48

Table 9. Own Funds Details (CBL)

	31 December 2019 (€' 000)	(B) REGULATION (EU) No. 575/2013 ARTICLE REFERENCE
Common Equity Tier 1 capital: instruments and reserves		
1	26,108	26 (1), 27, 28, 29, EBA list 26 (3)
2	97,776	26 (1) c)
3	245,892	26 (1)
6	369,776	
Common Equity Tier 1 capital: regulatory adjustments		
8	-80	36 (1) (b), 37
28	-80	
29	369,696	
44	0	
45	369,696	
58	0	
59	369,696	
60	1,658,658	
Capital ratios and buffers		
61	22.29%	92 (2) (a)
62	22.29%	92 (2) (b)
63	22.29%	92 (2) (c)
64	7.01%	CRD 128, 129, 130, 131, 133
65	2.50%	
66	0.01%	
67	0.00%	
67a	0.00%	
68	14.29%	CRD 128
Applicable caps on the inclusion of provisions in Tier 2		
77	1,020	62

Table 10. Own Funds Details (CBF)

2.2. Capital levels

2.2.1. Capital requirements for credit risk positions (Article 438 (1)(c) CRR)

Clearstream uses the Standardized Approach to calculate the capital requirements for credit risk. The following table shows the capital requirements for credit risk exposures:

Risk weighted assets	31 December 2019 (€' 000)			31 December 2018 (€' 000)		
	CH-Group	CBL	CBF	CH-Group	CBL	CBF
Central governments and central banks	1,150	3,316	78	1,060	4,963	37
Regional governments, local authorities and other public bodies	3,397	0	0	2,991	0	0
Institutions (banks)	521,061	451,133	61,380	1,058,434	1,043,733	52,214
Corporates	107,013	75,865	7,717	453,496	96,795	5,784
Retail	432	0	7	329	0	12
Exposures in default	0	10,273	0	0	0	0
Other (including equity holding)	154,945	97,759	12,403	173,511	22,050	4,380
Capital requirements from contributions to the default fund of a CCP	0	331	0	314	313	0
Total risk weighted assets	787,998	638,677	81,585	1,690,136	1,167,854	62,427
Capital requirements	CH-Group	CBL	CBF	CH-Group	CBL	CBF
Central governments and central banks	92	265	6	85	397	3
Regional governments, local authorities and other public bodies	272	0	0	239	0	0
Institutions (banks)	41,685	36,091	4,910	84,675	83,499	4,177
Corporates	8,561	6,069	617	36,280	7,744	463
Retail	35	0	1	26	0	1
Exposures in default	0	822	0	0	0	0
Other (including equity holding)	12,396	7,821	992	13,881	1,764	350
Capital requirements from contributions to the default fund of a CCP	0	27	0	25	25	0
Total capital requirements	63,040	51,094	6,527	135,211	93,428	4,994

Table 11. Capital requirements for credit risk

Note: Differences in the capital usage for institutions derive mainly from different allocation algorithms related to collateral.

2.2.2. Capital requirements for credit valuation adjustments

Clearstream uses the Standardized Method to calculate the capital requirements for CVA risk which arises from CBL transactions only. The following table shows the resulting capital requirements:

	31 December 2019 (€' 000)			31 December 2018 (€' 000)		
	CH-Group	CBL	CBF	CH-Group	CBL	CBF
Capital requirements	143	139	0	69	70	0

Table 12. Credit valuation adjustment

Note: The data for CH-Group and CBF is based on German GAAP according to the German Commercial Code (HGB). The data for CBL is based on International Financial Reporting Standards (IFRS).

2.2.3. Capital requirements for market risk positions (Article 438 (1)(e) CRR)

Clearstream uses the Standardised Approach to calculate the capital requirements for market risk positions.

Foreign Exchange risk (total)	31 December 2019 (€' 000)			31 December 2018 (€' 000)		
	CH-Group	CBL	CBF	CH-Group	CBL	CBF
Capital requirements	-	1,972	-	2,577	-	859

Table 13. Market price risk

2.2.4. Capital requirements for operational risk (Article 438 (1)(f) CRR)

The capital requirements for backing operational risk according to the Advanced Measurement Approach (AMA) amounted to a capital requirement as follows:

Operational risk (AMA)	31 December 2019 (€' 000)			31 December 2018 (€' 000)		
	CH-Group	CBL	CBF	CH-Group	CBL	CBF
Own fund requirements	450,635	324,469	126,166	409,874	312,496	97,378

Table 14. Operational risk

The capital figure calculated as described above and in Chapter 6. applies for Clearstream Group. It covers the risk of all legal entities of the Group and is allocated to CBL and CBF afterwards. The allocation key is the proportion of the aggregate total expected yearly maximum loss amount allocated to CBL and CBF based on the assessed Operational Risk scenarios which are classified as tail² event scenarios.

As described in Chapter 6.3, the defined Operational Risk scenarios are reviewed on a regular basis and are, if necessary, adjusted.

2.2.5. Total capital requirements

The following table summarizes the capital requirements of the Clearstream entities:

	31 December 2019 (€' 000)			31 December 2018 (€' 000)		
	CH-Group	CBL	CBF	CH-Group	CBL	CBF
Total capital requirements	513,818	377,675	132,693	547,731	405,994	103,232
Eligible own funds	1,559,506	1,149,360	369,696	1,525,464	1,111,991	369,306
Capital ratio (%)	24.28%	24.35%	22.29%	22.28%	21.91%	28.62%

Table 15. Total capital requirements

2.2.6. Capital ratio

The capital requirements of CBL decreased in the reporting period. The decrease of the capital requirements resulted from a decrease of credit risk.

The capital requirements of CBF increased in total due to the increase of capital requirements for operational risk and credit risk.

On CH-Group level the decreased capital requirements were mainly driven by a decrease in credit risk capital requirements whereby the capital requirements for operational risk increased.

	31 December 2019 (€' 000)			31 December 2018 (€' 000)		
	CH-Group	CBL	CBF	CH-Group	CBL	CBF
Total capital requirements	513,818	377,675	132,693	547,731	405,994	103,232
Eligible own funds	1,559,506	1,149,360	369,696	1,525,464	1,111,991	369,306
Capital ratio	24.28%	24.35%	22.29%	22.28%	21.91%	28.62%

Table 16. Capital ratios

Note: Clearstream entities do not issue T1 or T2 securities, the eligible own funds consist entirely of CET1 capital. Therefore, the Capital Ratio in the table above is both the Common Equity Tier 1 ratio, the Tier 1 capital ratio, and the total capital ratio.

2.3. Countercyclical capital buffer (Article 440 CRR)

The countercyclical capital buffer aims to ensure that banking sector capital requirements take account of the macro-financial environment in which banks operate. According to Delegated Regulation (EU) 2015/1555 on the disclosure of information in relation to the compliance of institutions with the requirement for a countercyclical buffer, institutions need to disclose a geographical distribution of credit exposures relevant for the calculation of the countercyclical capital buffer which is attached in the Annex 2. of this report.

² Maximum loss is defined as EUR 750k and frequency less often than once in 20 years.

In the following tables the amounts of institution-specific countercyclical capital buffers are shown for CH-Group, CBL and CBF.

31 December 2019 (€'000)

010	Total risk exposure (€' 000)	6,422,721
020	Institution specific countercyclical buffer rate (%)	0.02%
030	Institution specific countercyclical buffer requirement (€' 000)	1,207

Table 17. Amount of institution-specific countercyclical capital buffer (CH-Group)

31 December 2019 (€' 000)

010	Total risk exposure	4,720,932
020	Institution specific countercyclical buffer rate	0.04%
030	Institution specific countercyclical buffer requirement	1,865

Table 18. Amount of institution-specific countercyclical capital buffer (CBL)

31 December 2019 (€' 000)

010	Total risk exposure	1,658,658
020	Institution specific countercyclical buffer rate	0.01%
030	Institution specific countercyclical buffer requirement	154

Table 19. Amount of institution-specific countercyclical capital buffer (CBF)

2.4. Leverage ratio (Article 451 CRR)

The delegated regulation on disclosure of the leverage ratio (EU) No 1423/2013 requires disclosure of detailed information.

As CH is exempted from the preparation of consolidated annual accounts in line with § 291 (1) HGB a reconciliation with Leverage Ratio total exposure measure is not possible. Therefore, in the following table the reconciliation of the Leverage Ratio total exposure measure to the relevant information in the published financial statements as of 31 December 2019 including any adjustments made are shown for CBL and CBF:

Summary comparison of accounting assets vs Leverage Ratio exposure measure

	CBL	CBF
Total consolidated assets as per published financial statements	15,474,770	2,168,459
Adjustment for investments in banking, financial, insurance or commercial entities that are consolidated for accounting purposes but outside the scope of regulatory consolidation	0	0
Adjustment for fiduciary assets recognised on the balance sheet pursuant to the operative accounting framework but excluded from the leverage ratio exposure measure	0	0
Adjustments for derivative financial instruments	55,858	0
Adjustment for securities financing transactions (ie repos and similar secured lending)	175,861	0
Adjustment for off-balance sheet items (ie conversion to credit equivalent amounts of off-balance sheet exposures)	304,479	0
Other adjustments	-184,826	-85
Leverage Ratio exposure	15,826,142	2,168,544

Table 20. Summary reconciliation of accounting assets and Leverage Ratio exposures (LRSum)

The following table shows that the on-balance sheet exposures are the biggest part of the Leverage Ratio total exposure measure. In addition to the on-balance sheet items, off-balance sheet items and derivative as well as SFT exposures are considered to determine the Leverage Ratio exposure measure as well as the Leverage Ratio itself.

	31 December 2019 (€' 000)			31 December 2018 (€' 000)		
	CH-Group	CBL	CBF	CH-Group	CBL	CBF
On-balance sheet exposures						
On-balance sheet items (excluding derivatives and SFTs, but including collateral)	10,039,100	8,860,574	1,290,659	13,181,771	11,733,296	1,480,535
(Asset amounts deducted in determining Basel III Tier 1 capital)	-104,888	-93,430	-80	-34,193	-13,379	-264
On-balance sheet exposures	9,934,212	8,767,144	1,290,579	13,147,578	11,719,917	1,480,271
Derivative exposures						
Replacement cost associated with all derivatives transactions (ie net of eligible cash variation margin)	0	62,257	0	0	67,794	0
Add-on amounts for PFE associated with all derivatives transactions	0	0	0	0	0	0
Risk position according to original risk method	61,659	0	0	0	0	0
Gross-up for derivatives collateral provided where deducted from the balance sheet assets pursuant to the operative accounting framework	0	0	0	0	0	0
(Deductions of receivables assets for cash variation margin provided in derivatives transactions)	0	0	0	0	0	0
(Exempted CCP leg of client-cleared trade exposures)	0	0	0	67,469	0	0
Adjusted effective notional amount of written credit derivatives	0	0	0	0	0	0
(Adjusted effective notional offsets and add-on deductions for written credit derivatives)	0	0	0	0	0	0
Total derivative exposures	61,659	62,257	0	67,469	67,794	0
Securities financing transaction exposures						
Gross SFT assets with no recognition of netting, after adjusting for sale accounting transactions	6,516,891	6,516,401	877,964	6,517,650	6,517,499	975,081
(Netted amounts of cash payables and cash receivables of gross SFT assets)	0	0	0	0	0	0
CCR exposure for SFT assets	51,491	175,861	0	2,857	86,229	0
Agent transaction exposures	0	15,841	0	0	26,257	0
Total securities financing transaction exposures	6,568,382	6,708,103	877,964	6,520,507	6,629,985	975,081
Other off-balance sheet exposures						
Off-balance sheet exposure at gross notional amount	337,450	288,638	0	459,411	413,162	0
(Adjustments for conversion to credit equivalent amounts)	-44,063	0	0	-43,231	0	0
Off-balance sheet items	293,387	288,638	0	416,180	413,162	0
Capital and total exposures						
Tier 1 capital	1,559,506	1,149,360	369,696	1,525,464	1,111,991	369,306
Total exposures (sum of on-balance, derivative, SFT and off-balance exposures)	16,857,640	15,826,142	2,168,544	20,151,734	18,830,858	2,455,352
Leverage Ratio						
Basel III Leverage Ratio	9.25%	7.26%	17.05%	7.57%	5.91%	15.04%
Choice on transitional arrangements and amount of derecognised fiduciary items						
Choice on transitional arrangements for the definition of the capital measure	-	-	-	-	-	-
Amount of derecognised fiduciary items in accordance with Article 429 (11) of Regulation (EU) No 575/2013	-	-	-	-	-	-

Table 21. Leverage Ratio common disclosure template (LRCom)

As the on-balance sheet items are the main part of the Leverage Ratio total exposure measure a sufficiently granular breakdown of the related components to identify the main composition of the leverage ratio is provided in Table 22. As Clearstream has no trading book the total on-balance sheet exposures are banking book exposures.

CRR leverage ratio exposures	31 December 2019 (€' 000)	31 December 2018 (€' 000)
Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures), of which:	10,039,100	13,181,771
Trading book exposures	0	0
Banking book exposures, of which:	10,039,100	13,181,771
Covered bonds	0	0
Exposures treated as sovereigns	8,450,191	8,735,168
Exposures to regional governments, MDB, international organisations and PSE NOT treated as sovereigns	16,986	14,957
Institutions	1,359,916	3,813,714
Secured by mortgages of immovable properties	0	0
Retail exposures	576	439
Corporate	107,150	453,276
Exposures in default	0	0
Other exposures (eg equity, securitisations, and other non-credit obligation assets)	104,281	164,217

Table 22. Split-up of on balance sheet exposures (excluding derivatives, SFTs and exempted exposures; LRSpl)

CRR leverage ratio exposures	CH-Group CBL CBF
Description of processes used to manage the risk of excessive leverage	Clearstream as CSD has a volatile balance sheet volume depending on customers' short-term cash deposits used to foster settlement. The balance sheet varies sharply within short timeframes and the cash received is reinvested with low credit and market risk. This position affects the Leverage Ratio exposure measure to a high degree. Thus, a direct management of leverage is only feasible to a limited extent.
Description of the factors that had an impact on the leverage ratio during the period to which the disclosed leverage ratio refers	The leverage exposure, and therefore ratio, is primarily influenced by the volume of client deposits and the corresponding actions taken by Clearstream to place these funds in the market in as low risk a way as possible, through on-balance sheet placements and securities financing transactions.

Table 23. Description of qualitative items (LRQua)

3. Governance arrangements (Article 435 (2) CRR)

3.1. Clearstream Banking S.A.

3.1.1. General arrangements

Clearstream Banking S.A. ("CBL") is incorporated in Luxembourg in the form of a public limited company (Société Anonyme). It is governed by its Articles of Incorporation and applicable laws and regulations, such as Luxembourg company law.

CBL maintains a comprehensive *Suitability Assessment Policy*. The objective of this policy is to ensure that members of the Executive Board of CBL, members of the Supervisory Board of CBL, and key function holders ("KFH") of CBL are suitable in terms of reputation, experience, and governance criteria, as stipulated in the Luxembourg Banking Act, EBA Governance Guidelines, and CSDR.

CBL follows stringently the *Suitability Assessment Policy* for the recruitment and selection of members of the Supervisory Board and Executive Board, as described below. Also, CBL has diversity principles in place, which refer to educational and professional background, gender, age, and geographical provenance, to achieve a variety of views and experiences and to facilitate independent opinions within the supervisory and Executive Boards.

To benefit from a balanced gender diversity and to fulfil the requirement of Art. 27 (4) of the Regulation (EU) No 909/2014 the Supervisory Boards of Clearstream Banking AG and Clearstream Banking S.A. have approved the *Gender Diversity Policy* as published on Clearstream's website and decided on a target to increase the number of the under-represented gender in the management body.

The members of the Supervisory Board of Clearstream Banking S.A. agreed on the proposed 20% target quota for the representation of the under-represented gender (currently female) in both the Supervisory Board and the Executive Board until 31 December 2021.

Since 2018, the rules of the limitation of mandates in accordance with Article 38-2 of the Luxembourg Banking Act must be complied with. Under this definition, and in consideration of the legal permissibility of the aggregation of mandates, on 31 December 2019 all members of the Executive Board and the Supervisory Board of CBL complied with these rules.

3.1.2. Executive board

According to CBL's governing documents, the Executive Board shall be composed of at least three members who are appointed by the Supervisory Board of CBL for a period of four years. The Executive Board is chaired by the CEO.

The recruitment process of members of the Executive Board starts with the Nomination Committee to prepare and the Supervisory Board to resolve on a job description and candidate profile for a specific position. Afterwards, the Nomination Committee identifies and recommends suitable members for the approval to the Supervisory Board. After the selection and nomination of a candidate, Boards & Committees Clearstream prepares a formal decision of the Supervisory Board. The appointment of new members of the Executive Board of CBL requires prior approval by the CSSF. Denis Schloremberg became a newly appointed member of the CBL Executive Board in 2019.

The Executive Board is responsible for managing CBL in accordance with the applicable laws, the Articles of Association, and its internal rules and regulations with the objective of creating sustainable value in the interest of the company, and taking into consideration the interests of the shareholders, employees, and other stakeholders. The Executive Board is responsible for establishing a proper business organisation, encompassing appropriate and effective risk management.

The members of the Executive Board must be professionally suitable and reliable for the management of a credit institution and central securities depository, and they must be able to devote sufficient time to fulfil

their tasks. Their professional competence requires sufficient theoretical and practical knowledge of the business of a credit institution and central securities depository.

The business distribution scheme regulates the allocation of tasks between the board members. Nevertheless, the Executive Board remains collectively responsible for the fulfilment of the duties as defined by law and set out in the Articles of Incorporation (overall responsibility).

Meetings of the Executive Board are held monthly or more frequently if required.

As at 31 December 2019, the Executive Board of Clearstream Banking S.A. consisted of five members, namely:

Name / Position	Number of directorships (as of 31/12/2019)
Philippe Seyll – Chief Executive Officer	7 (thereof 6 within Deutsche Börse Group)
João Amaral	1 (thereof 1 within Deutsche Börse Group)
Maurice Lamy	4 (thereof 4 within Deutsche Börse Group)
Mathias Papenfuß	5 (thereof 4 within Deutsche Börse Group)
Denis Schloremberg	1 (thereof 1 within Deutsche Börse Group)
Guido Wille	1 (thereof 1 within Deutsche Börse Group)

Table 24. Number of directorships held per Executive Board Member (CBL)

3.1.3. Supervisory Board

According to the Articles of Incorporation of CBL, the Supervisory Board consists of at least three members. The members of the Supervisory Board are required to fulfil certain criteria, as laid down in the *Suitability Assessment Policy*, and to comply with regulatory requirements, as set out in the section above.

Such criteria include, but are not limited to:

- Members of the management body should have an up-to-date understanding of the business of the company and its risks. The assessment of a member’s knowledge, skills and experience should consider both the theoretical experience attained through education and training and the practical experience gained in previous occupations.
- A member of the management body should be considered to be of good repute, honesty and integrity if there are no objective and demonstrable grounds to suggest otherwise and no reason to have reasonable doubt about his or her good repute, honesty and integrity.

The Nomination Committee prepares a job description and a candidate profile for a specific position, which is resolved by the Supervisory Board. Subsequently, the Nomination Committee identifies and recommends suitable candidates, who are sent for approval to the general meeting of shareholders. Following selection and nomination, Boards & Committees Clearstream prepares the formal decision of the general meeting of shareholders to appoint the candidate as new member. The appointments of members to the Supervisory Board require prior approval by the competent authority (CSSF). There were no new appointments in 2019.

As at 31 December 2019, the Supervisory Board consisted of the persons displayed in [Table 25](#), which also discloses the number of directorships held by each member, as required by Article 435 (2) of CRR.

Name / Position	Number of directorships (as of 31/12/2019)
Stephan Leithner – Chairman	10 (thereof 7 within Deutsche Börse Group)
Gregor Pottmeyer – Vice-Chairman	6 (thereof 6 within Deutsche Börse Group)
Oliver Engels	2 (thereof 2 within Deutsche Börse Group)
Marc Robert-Nicoud	3 (thereof 3 within Deutsche Börse Group)
Ernst Wilhelm Contzen	3 (thereof 1 within Deutsche Börse Group)
Wolfgang Gaertner	4 (thereof 1 within Deutsche Börse Group)
Marie-Jeanne Chèvremont	14 (thereof 1 within Deutsche Börse Group)

Table 25. Number of directorships held per Supervisory Board Member (CBL)

The Supervisory Board typically meets four times per year, with additional meetings possible if and as required.

3.1.4. Committees

In 2019, the Supervisory Board was supported by four separate committees being Audit Committee, Risk Committee, Nomination Committee and Remuneration Committee. All four committees have three members each, while the Audit Committee is chaired by an independent member of the Supervisory Board.

Audit Committee

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ Ernst-Wilhelm Contzen (Chairman) ▪ Marc Robert-Nicoud (Vice Chairman) ▪ Wolfgang Gaertner ▪ Marie-Jeanne Chèvremont (Q4) ▪ Karl van Gestel (Q1-Q2) 	<ul style="list-style-type: none"> ▪ Monitors accounting and financial reporting processes; ▪ Monitors the effectiveness of the internal audit function; ▪ Monitors the execution of audits by the external auditor, in particular, in relation to the selection and independence of the external auditor and the services provided by the external auditor (for example, scope, frequency or reports); ▪ Submits recommendations to the Supervisory Board to ensure the integrity of the reporting and accounting processes.

Table 26. Overview CBL Audit Committee

Nomination Committee

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ Wolfgang Gaertner (Chairman) ▪ Stephan Leithner ▪ Ernst Wilhelm Contzen 	<ul style="list-style-type: none"> ▪ Identifies, recommends and promotes, candidates to fill vacancies in the Executive Board (EB) and Supervisory Board (SB), with the objective to reach a balance and diversity of knowledge, skills and experience, as well as gender diversity among the respective members. ▪ Periodically assesses the general structure and performance of EB and SB and provides related recommendations to the SB for improvements. ▪ Assesses the knowledge, skills and experience of respective boards, on an individual and collective basis.

Table 27. Overview CBL Nomination Committee

Remuneration Committee

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ Stephan Leithner (Chairman) ▪ Gregor Pottmeyer (Vice Chairman) ▪ Wolfgang Gaertner 	<ul style="list-style-type: none"> ▪ Supervises the reasonableness of the remuneration system of executive management members. In particular, it supervises the appropriateness of the compensation of the Head of the risk function and of the compliance function as well as employees having a substantial influence on the overall risk profile of the institution. It also supports the Supervisory Board in monitoring the reasonableness of the remuneration system of employees as well as the institution. At the same time, it assesses the impacts of the remuneration system on the risk, capital and liquidity management; ▪ Supports the Supervisory Board in overseeing the internal control system and all other relevant areas in the structuring of the remuneration system

Table 28. Overview CBL Remuneration Committee

Risk Committee

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ Oliver Engels (Chairman) ▪ Stephan Leithner (Vice Chairman) ▪ Marc Robert-Nicoud 	<ul style="list-style-type: none"> ▪ Advises the Supervisory Board on the institution's overall current and future risk appetite, risk tolerance and risk strategy and assists the Supervisory Board in overseeing the implementation of that strategy; ▪ Reviews whether the conditions offered to customers take into account the institution's business model and risk structure. If this is not the case, the Risk Committee submits proposals to the Executive Board, about how the conditions applied to customers in accordance with the business model and the risk structure could be created; and ▪ Examines whether incentives provided by the remuneration system take into consideration the risk, capital and liquidity structure of the institution and the likelihood and timing of earnings; ▪ Assesses the effectiveness of the risk management function.

Table 29. Overview CBL Risk Committee

In 2019, the Risk Committee met 4 times (information disclosed as required by Article 435 (2) (d) CRR).

User committee

According to CSDR, a CSD is required to establish a User Committee for each security settlement system it operates. The user committee shall consist of representatives of issuers and participants in the securities settlement systems.

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ European Investment Bank ▪ Bank of New York Mellon ▪ Citi Bank ▪ BNP Paribas Securities Services ▪ UBS ▪ Barclays ▪ Northern Trust 	<ul style="list-style-type: none"> ▪ Submits non-binding opinions to the Executive Board ▪ Advises the Executive Board on key arrangements that may affect its members, including the criteria for accepting issuers or customers in their respective securities settlement systems and at the service level and the pricing structure.

Table 30. Overview CBL User Committee

3.2. Clearstream Banking AG

3.2.1. General Arrangements

Clearstream Banking AG (CBF) is a stock corporation incorporated in Germany. The German Stock Corporation Act (AktG) requires such a company to set up an Executive Board (§§ 76 et seq. AktG) and a Supervisory Board (§§ 95-116 AktG).

Clearstream Banking AG maintains a comprehensive *Suitability Assessment Policy*. The objective of this policy is to ensure that members of the Executive Board, members of the Supervisory Board and key function holders of CBF are suitable in terms of reputation, experience and governance criteria, as stipulated in the “Joint ESMA and EBA Guidelines on the assessment of the suitability of members of the management body and key function holders under Directive 2013/36/EU and Directive 2014/65/EU” (EBA/GL/2017/12/ESMA71-99-598) and BaFin guidance notes regarding the members of the Executive Board and the Supervisory Board in accordance with the German Banking Act as amended. CBF follows a stringent *Recruitment Procedure* for the selection of members of the Supervisory Board and Executive Board as described below. A suitability assessment is initiated about each appointment or election of a new board member, the resignation of a board member causing material changes to the composition of the management body and on a regular basis, at least annually.

To benefit from a balanced gender diversity and to fulfil the requirement of Art. 27 (4) of the Regulation (EU) No 909/2014 the Supervisory Boards of Clearstream Banking AG and Clearstream Banking S.A. have approved the *Gender Diversity Policy* as published on Clearstream’s website and decided on a target to increase the number of the under-represented gender in the management body.

The members of the Supervisory Board of Clearstream Banking AG agreed on a target quota amounted to 20% of the under-represented gender (currently female) in the Supervisory Board of Clearstream Banking AG and a target quota of 25% of the under-represented gender for the Executive Board of Clearstream Banking AG until 31 December 2021.

3.2.2. Executive Board

According to § 25a KWG and MaRisk certain functions and duties in several business areas have to be segregated up to the level of the Executive Board. In addition, all tasks have to be allocated in a clear manner to the responsible areas. Furthermore, the four-eyes principle as well as the role of a deputy should be determined. In order to fulfil the above-mentioned organisational requirements and in the light of the systemic importance of CBF, the articles of incorporation of CBF stipulate that the Executive Board consists of at least two members. A notification is provided to the competent authorities, as well as Key Function Holders (“KFH”) in the event of the appointment of new members of the Executive Board of CH. Volker Riebesell became a newly appointed member of the CBF Executive Board in 2019.

The Executive Board is inter alia responsible for the proper business organisation (in accordance with § 25c (3) number 1 in connection with § 25a of the German Banking Act). The Executive Board is also responsible for the business distribution plan which regulates the allocation of tasks between the board members in order to enable a more efficient management. Nevertheless, the Executive Board as a whole remains responsible for the fulfilment of the duties as defined by law and set out in the Articles of Incorporation (overall responsibility).

Meetings of the Executive Board shall be held regularly; further details, including but not limited to the interval between the meetings, shall be determined by the chairperson. Meetings are held as often as business requires, but at least one meeting per quarter should be scheduled each year.

The members of the Executive Board must be professionally suitable and reliable for the management of a credit institution and must be able to devote sufficient time to fulfil their tasks. Their professional competence requires sufficient theoretical and practical knowledge of the business of a credit institution.

Members of the Executive Board must have in particular:

- An understanding of financial markets, especially within the regulatory framework;
- Professional experience with credit institutions;
- Sufficient practical and professional experience in managerial positions.

The rules of the limitation of mandates in accordance with § 25c (2) KWG must be complied with. Under this definition and in consideration of the legal permissibility of the aggregation of mandates, on 31 December 2019 all members of the Executive Board of CBF complied with these rules.

As at 31 December 2019, the Executive Board of Clearstream Banking AG. consisted of five members:

Name / Position	Number of directorships (as of 31/12/2019)
Berthold Kracke - Chief Executive Officer	5 (thereof 4 within Deutsche Börse Group)
Tilman Fechter	1 (thereof 1 within Deutsche Börse Group)
Martina Gruber	2 (thereof 2 within Deutsche Börse Group)
Mathias Papenfuß	5 (thereof 4 within Deutsche Börse Group)
Volker Riebesell	1 (thereof 1 within Deutsche Börse Group)

Table 31. Number of directorships held per Executive Board Member (CBF)

3.2.3. Supervisory Board

CBF has established a Supervisory Board to supervise the Executive Board, in accordance with the mandatory provisions of the German Stock Corporation Act (AktG) in connection with the German One Third Participation Act ("Drittelbeteiligungsgesetz", "DrittelbG"). According to the DrittelbG, one third of the members of the Supervisory Board (two out of six) are employee representatives. The shareholders representatives of the Supervisory Board of CBF are elected by the shareholders in the annual general meeting of shareholders or, if there is the need of a replacement, in an extraordinary shareholders' meeting. The employee representatives are elected by the employees of CBF prior to that shareholders' meeting to elect an entirely new Supervisory Board. All members are elected for a period of five years (a term of office ending at the closing of the General Shareholders' Meeting, which votes on the discharge of the members of the Supervisory Board for the fourth fiscal year after the commencement of the term of office, not including such fiscal year in which the term of office has commenced).

According to the Articles of Incorporation, the Supervisory Board consists of six members. The Supervisory Board in its entirety must have the necessary skills, capabilities and experience to supervise and control the Executive Board of CBF. This requires understanding of the business of a credit institution. A notification is provided to the competent authorities in the event of the appointment of new members of the Supervisory Board of CBF. There were no new appointments in 2019.

In addition, at least two members of the Supervisory Board should have sound knowledge in each of the following areas

- accounting, finance and audit
- risk management and compliance
- information technology and security
- clearing business
- regulatory requirements

The rules of the limitation of mandates in accordance with § 25d (3) KWG must be complied with. Under this definition and in consideration of the legal permissibility of the aggregation of mandates, on 31 December 2019 all members of the Supervisory Board of CBF complied with these rules.

The Supervisory Board of CBF also agreed to support and make use of the existing Female Executive Mentoring (FEM) programme which is a part of the gender diversity initiative of Deutsche Börse Group as

well as the Deutsche Börse Group's Women's Network; both programmes promote the underrepresented gender on different levels.

As at 31 December 2019, the Supervisory Board consisted persons displayed in [Table 32](#), which also discloses the number of directorships held by each member, as required by Article 435 (2) of CRR.

Name / Position	Number of directorships
Stephan Leithner - Chairman	10 (thereof 7 within Deutsche Börse Group)
Oliver Engels - Vice-Chairman	2 (thereof 2 within Deutsche Börse Group)
Peter Gomber	3 (thereof 1 within Deutsche Börse Group)
Christina Bannier	1 (thereof 1 within Deutsche Börse Group)
Peter Eck	1 (thereof 1 within Deutsche Börse Group)
Norfried Stumpf	1 (thereof 1 within Deutsche Börse Group)

Table 32. Number of directorships held per Supervisory Board Member (CBF)

The Supervisory Board meets as often as business requires, but at least two meetings per half-year are scheduled each year, which generally take place around March, May, September and December.

3.2.4. Committees

EU Central Securities Depositories regulation No 909/2014 (CSDR) requires each Central Securities Depository (CSD) to implement an Audit Committee, a Remuneration Committee and a Risk Committee.

Additionally, CBF follows a proactive approach towards its customers by hosting a User Committee on a quarterly basis. It is a domestic user group that meets two to four times a year. If required, a user task force is formed taking care of ad hoc topics.

Membership as well as tasks and responsibilities are outlined below.

Audit Committee

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ Peter Gomber (Chairman) ▪ Oliver Engels (Vice Chairman) ▪ Norfried Stumpf 	<ul style="list-style-type: none"> ▪ Monitors accounting and financial reporting processes; ▪ Monitors the effectiveness of the risk management process, in particular, the internal control system (ICS), the risk management system and internal audit; ▪ Monitors the execution of audits, in particular, in relation to the selection and independence of the auditor and the services provided by the auditor (for example scope, frequency or reports); ▪ Submits recommendations to the Supervisory Board to ensure the integrity of the reporting and accounting processes.

Table 33. Overview CBF Audit Committee

Remuneration Committee

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ Stephan Leithner (Chairman) ▪ Christiane Bannier (Vice Chairman) ▪ Norfried Stumpf 	<ul style="list-style-type: none"> ▪ Supervises the reasonableness of the remuneration system of Executive Board members. In particular, it supervises the appropriateness of the compensation of the Head of the risk function and of the compliance function as well as employees having a substantial influence on the overall risk profile of the institution. It also supports the Supervisory Board in monitoring the reasonableness of the remuneration system of employees as

Members	Tasks and responsibilities
	<p>well as the institution. At the same time, it assesses the impacts of the remuneration system on the risk, capital and liquidity management;</p> <ul style="list-style-type: none"> ▪ Prepares the Supervisory Board resolutions regarding the determination of the aggregate remuneration of any member of the Executive Board, and by doing so, takes into account what effects the resolutions have on the risk and the risk management of the institution as well as the long-term interests of the shareholders, investors and other stakeholders; ▪ Designs and further develops the <i>Remuneration Policy</i> including the remuneration of the Executive Board; ▪ Supports the Supervisory Board in overseeing the internal control system and all other relevant areas in the structuring of the remuneration system; ▪ The Remuneration Committee shall cooperate with the Risk Committee. The Remuneration Committee shall use internal advice, for example from risk controlling, and external advice from individuals independent of the Executive Board. The Chair of the Remuneration Committee may obtain information from the Head of internal audit and the Head of the organisational units responsible for the development of the remuneration systems; ▪ Members of the Executive Board are not allowed to participate in meetings of the Remuneration Committee, the subject of which is their remuneration.

Table 34. Overview CBF Remuneration Committee

Risk Committee

Members	Tasks and responsibilities
<ul style="list-style-type: none"> ▪ Oliver Engels (Chairman) ▪ Stephan Leithner (Vice Chairman) ▪ Peter Eck 	<ul style="list-style-type: none"> ▪ Advises the Supervisory Board on the institution's overall current and future risk appetite, risk tolerance and risk strategy and assists the Supervisory Board in overseeing the implementation of that strategy; ▪ With the Audit Committee, submits proposals to the Executive Board about how the conditions applied to customers in accordance with the business model and the risk structure could be created; and ▪ Examines whether incentives provided by the remuneration system take into consideration the risk, capital and liquidity structure of the institution and the likelihood and timing of earnings. The tasks of the Remuneration Committee remain unaffected; ▪ Reviews whether the conditions offered to customers take into account the institution's business model and risk structure; ▪ If this is not the case, the Risk Committee takes advice from external experts, if necessary. It determines type, comprehensiveness, format and frequency of information to be provided by the Executive Board with regard to strategy and risk.

Table 35. Overview CBF Risk Committee

In 2019, the Risk Committee met 4 times (information disclosed as required by Article 435 (2) (d) CRR).

User Committee

According to the CSD Regulation, a CSD is required to establish a User Committee for each security settlement system it operates.

Clearstream Banking AG (CBF) operates the securities settlement systems CASCADE and CREATION and offers services through both systems. Consequently, CBF established two user committees.

The committees consist of representatives of issuers and participants in the securities settlement systems.

Members	Tasks and responsibilities
CASCADE <ul style="list-style-type: none">▪ BNP Paribas▪ Citigroup▪ Commerzbank▪ Deutsche Bank▪ Dwpbank▪ HSBC	<ul style="list-style-type: none">▪ Pursuant to Article 28 of the CSD Regulation (EU) 909/2014 (CSDR), the User Committee advises the Executive Board of the Company on the following topics:<ul style="list-style-type: none">– Committee shall advise the Executive Board on key arrangements that impact on its members, including the criteria for accepting issuers or participants in the securities settlement systems and on service level;– Committee may submit non-binding opinions to the Executive Board, containing detailed reasons regarding the pricing structures of the securities settlement systems of the Company.▪ The advice of the Committee shall be independent from any direct influence of the Executive Board.▪ Apart from the CSDR requirements, the Executive Board may seek advice and recommendation from the User Committees with respect to matters which are of relevance for the business of the Company and its relationship with customers, in particular:<ul style="list-style-type: none">– Business and marketing strategy;– Development of new products;– General market trends and requirements
CREATION <ul style="list-style-type: none">▪ BNP Paribas▪ Commerzbank▪ Deutsche Bank▪ Dwpbank▪ HSBC▪ LBBW	

Table 36. Overview CBF User Committee

3.3. Clearstream Holding AG

3.3.1. General arrangements

Clearstream Holding AG is incorporated in Germany in the form of a stock corporation (Aktiengesellschaft). The German Stock Corporation Act (Aktiengesetz – “AktG”) requires such a company to set up an Executive Board (§§ 76 et seq. AktG) and a Supervisory Board (§§ 95-116 AktG).

CH maintains a comprehensive *Suitability Assessment Policy* and a corresponding side-letter defining specific job descriptions of Supervisory Board and Executive Board members. The objective of this policy is to ensure that the members of the Executive Board, the members of the Supervisory Board and key function holders of CH (as well as of the subsidiaries of CH that are to be qualified as credit institutions) are suitable in terms of reputation, experience and governance criteria, as stipulated in the “Joint ESMA and EBA Guidelines on the assessment of the suitability of members of the management body and key function holders under Directive 2013/36/EU and Directive 2014/65/EU” (EBA/GL/2017/12/ESMA71-99-598) and BaFin guidance notes regarding the members of the Executive Board and the Supervisory Board in accordance with the German Banking Act as amended.

The suitability assessment is initiated when it is intended to appoint or elect a new member of the Executive Board or the Supervisory Board, if a member resigns from the mandate causing material changes to the composition of the management body and on a regular basis, at least once a year. The rules of the limitation

of mandates in accordance with § 25c (2) KWG and § 25d (3) KWG must be complied with. Under this definition, and in consideration of the legal permissibility of the aggregation of mandates, on 31 December 2019 all members of the Supervisory Board and Executive Board of CH complied with these rules. In the following paragraphs, the composition of all boards and committees is reflected as at the end of the reporting period, being 31 December 2019.

3.3.2. Executive Board

According to CH's Articles of Incorporation, the Executive Board may consist of one or several members who are appointed by the Supervisory Board of CH for a period of three years. The Executive Board is chaired by the CEO. A notification is provided to the competent authorities in the event of the appointment of new members of the Executive Board of CH. Samuel Riley became a newly appointed member of the CH Executive Board in 2019.

The Executive Board is inter alia responsible for the proper business organisation (in accordance with § 25c (3) number 1 in connection with § 25a KWG). The Executive Board is also responsible for the adoption of the business distribution plan, which regulates the allocation of tasks between the board members in order to enable a more efficient management of the company. Nevertheless, the Executive Board, as a whole, remains responsible for the fulfilment of the duties as defined by law and set out in the Articles of Incorporation (overall responsibility).

The members of the Executive Board must be professionally suitable and reliable for the management of a Financial Holding Company and must be able to devote sufficient time to fulfil their tasks. Further, sufficient theoretical and practical knowledge of the business of a financial holding company is required from all members of the Executive Board. In addition, the members of the Executive Board must have:

- An understanding of banking and financial markets, especially within the regulatory framework;
- An understanding of managing a financial holding company;
- Sufficient experience in managerial positions.

Meetings of the Executive Board are held monthly; further details are determined by the chairperson. Additional meetings take place, if required for the well-being of CH.

As at 31 December 2019, the Executive Board consisted of the persons displayed in [Table 37](#), which also discloses the number of directorships held by each member, as required by Article 435 (2) of CRR.

Name / Position	Number of directorships (as of 31/12/2019)
Philip Brown – Chief Executive Officer	3 (thereof 3 within Deutsche Börse Group)
Berthold Kracke	5 (thereof 4 within Deutsche Börse Group)
Samuel Riley	1 (thereof 1 within Deutsche Börse Group)
Philippe Seyll	7 (thereof 6 within Deutsche Börse Group)

Table 37. Number of further directorships held per Executive Board Member (CH)

3.3.3. Supervisory Board

CH has established a Supervisory Board to supervise the Executive Board, in accordance with the mandatory provision of the German Stock Corporation Act (§§ 95-116 AktG). The members of the Supervisory Board of CH are elected by the shareholders. This in principle takes place during the annual general meeting of shareholders. The members are elected for a period of five years (a term of office ending at the closing of the General Shareholders' Meeting, which votes on the discharge of the members of the Supervisory Board for the fourth fiscal year after the commencement of the term of office, not including such fiscal year in which the term of office has commenced). If there is the need of a replacement, this is done by an extraordinary shareholder's meeting. A notification is provided to the competent authorities in the event of the appointment of new members of the Supervisory Board of CH. There were no new appointments in 2019.

- According to the Articles of Incorporation of CH, the Supervisory Board consists of three members. The members of the Supervisory Board are required to fulfil certain criteria, as laid down in the *Suitability Assessment Policy*, and to comply with regulatory requirements, as set out in the section above. Furthermore, the Supervisory Board in its entirety must have the necessary skills, capabilities and experience to supervise and control the Executive Board of CH. This requires understanding of the business of a financial holding company. In addition, at least two members of the Supervisory Board should have a sound knowledge in each of the following areas:
 - accounting, finance and audit
 - risk management and compliance
 - information technology and security
 - clearing business
 - regulatory requirements

As at 31 December 2019, the Supervisory Board consisted of the persons displayed in [Table 38](#), which also discloses the number of directorships held by each member as required by Article 435 (2) of CRR.

Name / Position	Number of directorships (as of 31/12/2019)
Stephan Leithner	10 (thereof 7 within Deutsche Börse Group)
Gregor Pottmeyer	6 (thereof 6 within Deutsche Börse Group)
Christoph Böhm	3 (thereof 3 within Deutsche Börse Group)

Table 38. Number of directorships held per Supervisory Board Member (CH)

The CH Supervisory Board meets as often as business requires, but at least two meetings are scheduled each half-year. In these meetings, it is informed about normal business activities as well as all substantial business events. In case of extraordinary incidents, the CH Supervisory Board is informed immediately.

3.3.4. Committees

Due to the small size of the Supervisory Board (three members), it is not necessary to set up any committees. However, the Supervisory Board in its entirety takes over the responsibilities stipulated for committees in § 25d (8) - (12) KWG.

4. Risk management overview

4.1. Risk management framework

Risk management is a fundamental component of Clearstream's management and control framework. Effective and efficient risk management is vital to protect Clearstream's interests and simultaneously enables Clearstream to achieve its corporate goals. Clearstream has therefore established a group-wide risk management system comprising roles, processes and responsibilities applicable to all employees and organisational units of Clearstream. This ensures that emerging risks are identified and managed as early as possible.

4.1.1. Risk strategy (Article 435 (1)(a) CRR)

Clearstream Risk Management (CRM) has developed three risk strategy statements, which are linked to Clearstream's overall business strategy, related to all entities.

Risk limitation – CRM aims to protect and ensure continuity of operations with its risk limitations.

Supporting growth in the various business divisions – CRM supports the growth of the business and the business division to expand their overall business.

Appropriate risk and return ratio – Clearstream has set itself the goal that risk and return should be in a reasonable proportion across the product and customer base.

The analysis of initiatives and project related to the business strategy is an essential part of the annual Risk Strategy review. The Clearstream Risk Strategy process follows a five-step process covering planning & review, assessment, risk bearing capacity (RBC) limit allocation, approval and implementation. The strategy process takes changing market and the regulatory environment into account as well as feedback from internal and external stakeholders. Clearstream's risk strategy is based upon its business strategy and regulates the extent of risks taken through its various business activities.

All members of the Executive Board of Clearstream are ultimately responsible for the risk strategy, which reflects Clearstream's risk appetite defining the maximum loss the Executive Board is willing to assume in one year, the risk tolerance, as well as, desired performance levels. It is Clearstream's intention to maintain risk at an appropriate and acceptable level. Moreover, the members of the Executive Board ensure that the risk strategy is integrated into all business activities and that adequate measures are in place to implement the strategies, policies and procedures.

4.1.2. Risk appetite (Article 438 (1)(a) CRR)

The risk strategy includes statements concerning risk appetite and sets limits. The following two principles are the basis for the quantitative risk appetite:

- Required Economic Capital – Economic perspective (former Liquidation principle): The *Required Economic Capital* is the Value at Risk (VaR) based on a 99.98 percent confidence level. Required Economic Capital is compared with the Available Risk-Bearing Capacity ("ARBC"), which is defined as regulatory own funds (eligible regulatory capital) minus adjustments for unrealized losses, for non-consolidated entities as well as for potential further reasons. The Available Risk-Bearing Capacity is updated according to the respective regulatory reporting frequency.
- Earnings at Risk: *Earnings at Risk* is the VaR based on 99 percent confidence level. This VaR is used for information purposes only at CH-Group, CBL and CBF level. It is compared with the budgeted EBITDA.

The RBC for individual risk types is defined as a fraction of the overall Risk-Bearing Capacity. When allocating the respective Risk-Bearing capacity to a risk type, the respective risk profile for Clearstream is taken into account.

4.1.3. Risk profile

The risk profile of Clearstream differs fundamentally from those of other financial services providers. Clearstream differentiates between three major risk types that are managed and controlled with distinct

methods. These risk types are operational risk, financial risk and business risk. Operational risk is assessed as the major risk type within Clearstream.

Financial risks (divided into credit, market and liquidity risks), as well as operational risk are described in the further sections.

The risk strategy was approved by the Executive Board of Clearstream in May 2020.

4.1.4. Risk culture

Risk awareness and a corresponding risk-conscious culture are encouraged, amongst other things, through appropriate organisational structures and responsibilities, adequate processes and the knowledge of employees. The appropriateness of the risk management and controlling systems is regularly checked. Overall, Clearstream’s risk culture is based on the Financial Stability Board’s four indicators of a sound risk culture: tone from the top, accountability, effective communication and challenge, and incentives, thereby striving for clear risk ownership and accountability.

4.1.5. Risk management process

Clearstream’s risk management process is based on the three lines of defence model, see [Figure 3](#). Furthermore, the process aims at ensuring that all threats, causes of loss and potential disruptions are:

- Properly identified as soon as possible (identification);
- Centrally recorded (notification);
- Assessed (that is, quantified in financial terms to the largest possible extent);
- Controlled (mitigation & control), and
- Reported in a timely manner and consistently, together with suitable recommendations to the Executive Board (monitoring & reporting).

These five key processes as well as adequate quality standards, are defined in the *Group Risk Management Policy* and are reviewed on an ongoing basis by an independent audit function.

Controlling risks is performed in the decentralised business areas, that is, where the risks occur. Risk control in the Clearstream operational units is ensured by nominating “Operational Risk Representatives” who are responsible for identifying, notifying and controlling any risk in their area. Clearstream Risk Management, a central risk controlling function within Clearstream, assesses all existing and potential new risks and reports on a quarterly basis, and if necessary ad hoc, to the Executive Board.

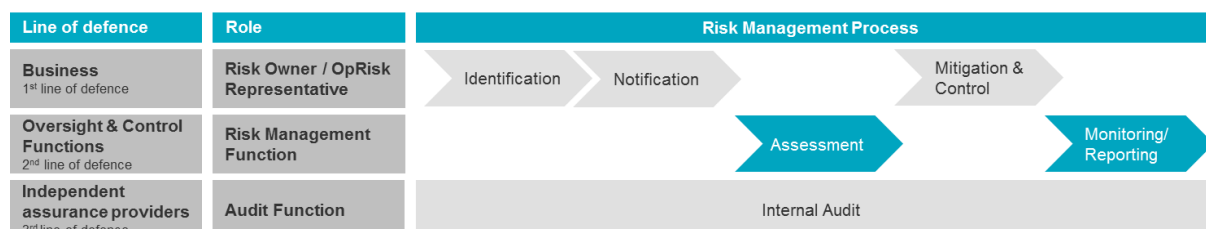


Figure 3. Five-level risk management system with central and decentralized responsibilities

4.1.5.1. Risk identification

Risk identification includes the identification of all threats, causes of loss and potential disruptions with regard to existing or new processes as well as internal activities or external factors.

More specifically, the risk identification process is on one hand proactive, based on regular reviews of processes in order to identify weak areas and points of failure (e.g. manual processes, processes without double keying or four-eyes controls in place, specific procedures subject to high volumes or tight deadlines) or based on scenarios of disruption or failure taking into consideration all sources of issues (e.g. unavailability of systems, human error). For the purpose of properly investigating potential risks for Clearstream, a risk inventory process has been established. The inventory process is carried out at least once a year by Clearstream Risk Management. On the other hand, the risk identification process is also reactive as a consequence of an incident.

The identification phase also includes the quantification of risks in the form of parameters based either on statistical data, in the case of actual process monitoring, or on subjective expert judgement when available statistics are insufficient.

All organisational units and individual employees are obliged to identify and quantify potential risks within their area of responsibility.

4.1.5.2. Risk notification

The process step of risk notification ensures that risks are centrally recorded. To do so, all organisational units and individual employees must notify Clearstream Risk Management in a timely manner of the risks that they have identified.

4.1.5.3. Risk assessment

Clearstream assesses material risks on an ongoing basis. It applies both the liquidation principle and the going-concern principle to aggregate risks at company level. The main instrument that Clearstream uses for the purpose of quantification is the Value at Risk ("VaR") concept. The VaR quantifies the risks to which a company is exposed and indicates the maximum cumulative loss that Clearstream could face if certain independent loss events materialise over a specific time horizon for a given probability.

Clearstream also considers extreme scenarios and factors these into its risk management. Such extreme scenarios include both stress tests across all risk types and stress tests for specific material risk types.

4.1.5.4. Risk mitigation and control

Risk mitigation and control involves the determination and implementation of the most appropriate reaction to the identified risk. It encompasses risk avoidance, risk reduction, risk transfer and intentional risk acceptance.

All organisational units and employees must perform risk control and implement mitigating actions.

4.1.5.5. Risk monitoring and reporting (Article 435 (1)(e))

Clearstream Risk Management is the independent risk controlling function of Clearstream, responsible for monitoring and reporting risks.

A detailed risk report is submitted to the Executive Board of Clearstream at least once a quarter.

Limit breaches are explained in detail and reported to the Executive Board before the 10th business day following the end of the respective quarter of the year or ad-hoc in case the regular monitoring process identifies a limit breach. The regular risk reports contain risk quantification results in comparison with the limits, risk related qualitative information, information about stress tests and capital adequacy information.

In addition to the above-mentioned risk monitoring and reporting functions, Internal Audit serves as the 3rd line of defence and provides further assurance of the risk management process by conducting independent audits.

In the Executive Board meeting on 26 March 2020 the Executive Board concluded that the Risk Management System for the reporting period was effective.

4.1.6. Concise Risk Statement (Article 435 (1)(f) CRR)

Article 435(1)(f) CRR requirements	Reference sections in CH Pillar 3 Report 2019
Risk profile	4.1.3. Risk profile
Strategy	4.1.1. Risk strategy (Article 435 (1)(a) CRR) 4.1.4. Risk culture
Management of risk	4. Risk management overview 4.1. Risk management framework 4.1.5. Risk management process 4.1.5.1. Risk identification 4.1.5.2. Risk notification 4.1.5.3. Risk assessment

	<p>4.1.5.4. Risk mitigation and control</p> <p>4.1.5.5. Risk monitoring and reporting</p> <p>5. Management of credit risk</p> <p>6. Management of operational risk</p> <p>7. Management of market risk including interest rate risk of exposures on positions not included in the trading book</p> <p>8. Management of liquidity risk</p>
Risk Tolerances	4.1.2. Risk appetite (Article 438 (1)(a) CRR)
Key Ratios and Figures	<p>2.1.3. Own fund details</p> <p>2.2. Capital levels</p> <p>2.2.1. Capital requirements for credit risk positions (Article 438 (1)(c) CRR)</p> <p>2.2.2. Capital requirements for credit valuation adjustments</p> <p>2.2.3. Capital requirements for market risk positions (Article 438 (1)(e) CRR)</p> <p>2.2.4. Capital requirements for operational risk (Article 438 (1)(f) CRR)</p> <p>2.2.5. Total capital requirements</p> <p>2.3. Countercyclical capital buffer (Article 440 CRR)</p> <p>2.4. Leverage ratio (Article 451 CRR)</p> <p>5.9. 47Disclosure on credit risk exposures (Article 442, 444, 453 (f) CRR)</p> <p>5.10. Disclosure of counterparty credit risk (CCR) (Article 439 CRR)</p> <p>5.11. Disclosure of equities not included in the trading book (Article 447 CRR)</p> <p>5.12. Asset encumbrance (Article 443 CRR)</p> <p>6.6. Disclosure on operational risk (Article 446 CRR)</p> <p>7.6. Disclosure exposures for market risk</p> <p>7.7. Disclosure exposures on interest rate risk on positions not included in the trading book (Article 448 CRR)</p> <p>8.3.1. Key Liquidity Indicators</p> <p>8.6. Disclosure on Liquidity Coverage Ratio (LCR)</p>

The CH Executive Board approved the above Concise Risk Statement as required by Article 435(1)(f) CRR.

5. Management of credit risk

Credit risk refers to the risk that a counterparty may default and therefore be unable to partly or entirely meet its liabilities against Clearstream.

5.1. Strategy and process (Article 435 (1)(a) CRR)

Given the unique nature of the Clearstream business, its lending operations cannot be compared with those of other credit institutions. Firstly, the loans are extended solely on an extremely short-term basis. Secondly, they are extended solely for the purposes of increasing the efficiency of securities settlement. With a few exceptions of selected central banks, these loans are fully collateralized. Moreover, loans are only granted to creditworthy customers with very good credit ratings and credit lines granted are uncommitted and can be revoked at any time.

Credit risk is classified as material risk in Clearstream's risk strategy. The risk strategy for credit risk follows the overall risk strategy laid out in [Chapter 4.1.1](#). The risk management process for credit risk follows the overall risk management process as presented in [Chapter 4.1.5](#).

5.2. Structure and organisation (Article 435 (1)(b) CRR)

The credit risk management function is performed by dedicated organizational units and governing bodies based on the *Credit Policy*. In particular, the following tasks are performed, and responsibilities are assigned:

- The creditworthiness of potential new counterparties and the creditworthiness of issuers of collateral accepted by Clearstream is assessed by Credit Section.
- The creditworthiness of existing counterparts is regularly reviewed and continuously monitored.
- Collateral eligibility is defined and approved by the Credit Section. The monitoring of recoverability of collateral is also operated by the Clearstream Default Management.
- Any exception to the *Credit Policy* must be approved by the respective Executive Board.

5.3. Assessment (Article 435 (1)(c) CRR)

In the natural course of day-to-day business transactions, Clearstream is exposed to credit risk from a multitude of sources. Credit risk is present in all of Clearstream's primary businesses – this includes custody (mainly related to asset servicing activities), settlement, securities financing, treasury operations and from settlement over the Bridge with Euroclear.

Sources of credit risk are assessed after considering all business segments, products and services. The list of sources of credit risk is updated annually. Moreover, the list of sources of credit risk is updated as per the Material Change Procedure requiring new products/services to be subjected to a Clearstream Risk Committee (CRC) decision prior to approval.

5.3.1. Limits

With regard to credit risk, the credit risk strategy is translated into a limit system, which is monitored on a regular basis and ad hoc.

Credit is exclusively granted on a collateralised basis, with the exception of certain unsecured settlement limits granted to sovereign and supranational institutions (as per the exemption foreseen in Art.23.2 of CSDR (EU) No 2017/390). Borrowers in Clearstream are central banks, banks and financial institutions. Furthermore, credit limits are set for the placement of funds with counterparties. The credit processing is arranged in guidelines and work instructions.

All credit risk exposures are regularly reviewed and monitored. The exposure limits (on level of each single customer and on level of each country) are set to ensure that Clearstream does not take too large an exposure, and therefore risk, on too few participants or counterparties.

5.3.2. Stress testing

The term “stress test” comprises the entirety of qualitative and quantitative analysis methods of rare but plausible events. There are several stress tests performed for credit risk, e.g.:

- The “Default of the Largest Counterparty Group Stress Test”, where the default of the counterparty group with the largest unsecured exposure is simulated on a monthly basis, after utilisation of all respective collateral and after taking the recovery rate into account.
- The “Economic Deterioration Stress Test”, where the impact of a deterioration of the economic environment on Clearstream is simulated on a monthly basis. To capture the worsening of the economy, certain credit risk model parameters are adjusted compared to the standard VaR simulation.

The results of the “Default of the Largest Counterparty Group Stress Test” and the “Economic Deterioration Stress Test” are compared to limits, which are defined as a fraction of the available risk bearing capacity. The stress test results are reported to the Executive Boards on a quarterly basis and to the Supervisory Board on a half-yearly basis.

In addition to the stress tests defined above, a “Reverse Credit Stress Test” is being performed, whose aim is to identify the number of unsecured credit lines that exceed the available risk bearing capacity.

5.4. Mitigation and control (Article 435 (1)(d) & 453 CRR)

Credit risk mitigation techniques, used by Clearstream, are composed of hedging and collateralisation.

Collateral eligibility is defined, approved and reviewed on a yearly basis by the Credit Section. Eligibility and haircut are dependent on the credit, market, liquidity and legal risks of the security. Securities that are eligible are subject to a margin deduction from their market value. Securities issued by or correlated to the customer are not eligible as collateral. Any transaction on a given account that would exceed the available collateral is automatically blocked by the system.

Collateralisations are also used in connection with the settlement credit limits. To facilitate the clearance of securities transactions against payment two types of credit limits are currently available:

- the Technical Overdraft Facility (TOF) and
- the Unconfirmed Funds Facility (UCF).

Under the terms and conditions of the TOF and the UCF contracts Clearstream has a right of pledge on all the customer’s assets held on the customer’s account(s) defined as pledge account(s) to secure obligations towards Clearstream by the customer for the services rendered to this customer.

5.5. Collateralized placing

CBL places a major part of the Group’s liquidity on the basis of reverse repo agreements with a maximum maturity of one year, but usually with maturities of three months or less. Repo transactions must be governed by a Global Master Repurchase Agreement (GMRA) and are only closed with banking counterparties fulfilling minimum rating criteria. Securities eligible for these transactions must also fulfil a specific set of requirements as e.g. daily pricing, minimum rating or a maximum remaining life to maturity.

Cross-currency collateralisation is in general possible. It was not used for bilateral transactions but in the context of triparty repos. Bilateral transactions must be “plain vanilla” on a single fixed-income security. In triparty transactions (including Eurex Repo GC Pooling transactions), multiple fixed-income securities may be taken as collateral. Structured transactions are not allowed.

Haircuts on the securities are applied within triparty repo transactions. All collaterals are valued daily. To secure the cash lent through reverse repurchase agreements, CBL agrees to margin calls with the repo counterparty on a daily basis to keep cash and collateral in balance.

5.6. ASL

ASL (Automated Securities Lending) is a lending programme that allows customers who are short of securities due to settlement failure to borrow securities from other Clearstream customers (lenders).

CBL acts as:

- Lending agent, offering:
 - Automatic detection of loan requirements to cover a failed trade;

- Automatic identification of loan supply from ASL lenders;
- Anonymous transfer of securities to the ASL borrower (the undisclosed relationship between lender and borrower);
- Administration of the loan.
- Collateral agent, monitoring the quality and sufficiency of collateral regarding:
 - Eligibility;
 - Collateral value;
 - Concentration limits;
 - Fluctuations in the market values of positions pledged as collateral (mark-to-market of the loan and the collateral);
 - Securities prices, reviewed several times a day depending on the closing time of the market;
 - Automatic collateral substitution.
- Guarantor for the collateralised loans:
 - Underwriting the risk involved if the borrower defaults on its obligations;
 - Managing collateral securities pledged by the borrower to CBL;
 - Assigning loan limits to borrowers to avoid any new loan opening if the limit is reached.

5.7. ASLplus

The ASLplus Programme is a Securities Lending programme that enables customers to enhance the revenues that can be realised as a lender by offering access to the wholesale trading market. CBL acts as principal (borrower) to the lenders in ASLplus and lends on securities to market participants through various counterparties. CBL further undertakes administrative functions and provides a secure settlement environment.

The Credit Section defines collateralised securities borrowing limits for each borrower and credit limits are agreed on the basis of standard framework agreements between CBL and each borrower.

Collateral for ASLplus business is delivered in a collateral pool serving several loans. Out of the pool, collateral valued at least to the requested collateral value based on internal credit rules is blocked for the total of the associated loans. No allocation on a loan by loan basis is done for credit purposes.

As for the collateralised placing, a zero weighting by the application of Article 227 CRR is, in general, possible. As the lending business is covering a wider scope of securities that do not fulfil the criteria as laid down in Article 227 CRR, while the collateral given by the ultimate lender only partially fulfils these criteria, only a portion is zero weighted. For the remainder, the supervisory haircuts are applied. As there is a notable portion of cross-currency collateralisation additional FX haircuts are applied.

5.8. Monitoring and reporting

The Credit Section reports new credit lines and changes of credit lines (increases as well as reductions), changes of the internal rating for customers and credit exposures to the Group Risk Monitoring section. Besides that, limit breaches, if any, are reported to the relevant Executive Board and to Group Risk Monitoring.

The reporting approach as described under [Chapter 4.1.5.5](#) also applies to the management of credit risk. On this basis, Group Risk Monitoring assesses the credit risk and reports VaR results as well as risk issues to the Executive Boards. Besides the assessment of the VaR, Group Risk Monitoring also measures credit risk concentration and performs stress test calculations on credit risk (see [Chapter 5.3.2](#)).

5.9. Disclosure on credit risk exposures (Article 442, 444, 453 (f) CRR)

In order to determine the own funds requirement for credit risk under Pillar 1, Clearstream uses the Standard Approach as defined in Article 111 et seq. CRR.

For the central governments and central banks' exposure class, Clearstream uses the External Credit Assessments Institution (ECAI) by Standard & Poor's, Moody's and Fitch Ratings. For regional governments or local authorities, public sector entities and institutions (credit institutions, investment firms and other dedicated financial counterparties) exposure classes, the dedicated risk weight is derived from that of the respective country of residence. The German supervisors have been notified of the use of credit assessments by Standard & Poor's, Moody's and Fitch Ratings. The risk weights of the remaining exposure classes are mainly derived from unrated positions meaning that no ECAI has been nominated.

Clearstream complies with the risk weighting as defined in Section 2 of Chapter 2 of Part Three, Title II of the CRR.

Clearstream applies credit risk mitigation ("CRM") techniques. Clearstream uses the comprehensive method for financial collateral according to Article 223 CRR for the purposes of credit risk mitigation.

For capital requirements purposes, according to Article 227 CRR the application of zero volatility adjustments is possible. Where the conditions of the regulation stated above are not fulfilled, supervisory haircuts as laid down in Article 224 CRR apply. In cases of FX mismatch, further cross-currency haircuts are applied.

The following tables show the total credit risk exposure values per exposure class and risk weight before and after applying credit risk mitigation techniques (CRM) and credit conversion factor (CCF) at the end of the period as well as the average credit risk exposure values after applying CRM and CCF.

31 December 2019 (€' 000)

Exposure class	Risk weight	Exposure value before	Exposure value after CRM*
		CRM* and CCF**	and CCF**
	0%	7,226,785	7,177,827
	20%	2,013	2,013
	50%	441	441
Central governments and central banks	100%	338	338
	150%	127	127
	Total	7,229,704	7,180,746
	0%	529,902	529,902
	20%	16,986	16,986
Regional governments, local authorities and other public bodies	Total	546,888	546,888
	0%	739,544	739,544
Multilateral development banks and international Organisations	Total	739,544	739,544
	2%	125,000	-
	20%	65,297,138	2,585,227
Institutions	50%	801,863	6,763
	100%	634	634
	Total	66,224,635	2,592,624
	100%	106,364	106,332
Corporates	150%	454	454
	Total	106,818	106,786
	75%	576	576
Retail	Total	576	576
	0%	5	5
	100%	70,496	70,496
Other (including equity holding)	250%	33,779	33,779
	Total	104,281	104,281
Total 2019		74,952,445	11,271,444
Total 2018		62,780,459	14,258,019

* CRM (Credit Risk Mitigation techniques)

** CCF (Credit Conversion Factor)

Table 39. Total exposure by asset classes and risk weights (CH-Group)

Average exposure over the period (€' 000)

Exposure class	Exposure value before CRM* and CCF**
Central governments and central banks	8,217,339
Regional governments and local authorities	300,797
Public sector entities	401,092
Multilateral development banks	615,556
International Organisations	15,499
Institutions	59,034,624
Corporates	292,906
Retail	403
Exposures in default	-
Equity exposures	25,540
Other	66,536
Total 2019	68,970,292
Total 2018	66,055,825

* CRM (Credit Risk Mitigation techniques)

** CCF (Credit Conversion Factor)

Table 40. Average exposure by asset classes and risk weights (CH-Group)

31 December 2019 (€' 000)

Exposure class	Risk weight	Exposure value before CRM* and CCF**	Exposure value after CRM* and CCF**
	0%	6,156,704	6,107,746
	20%	1,600	1,600
Central governments and central banks	50%	4,273	4,273
	100%	859	859
	Total	6,163,436	6,114,479
Regional governments, local authorities and other public bodies	0%	496,638	496,638
	Total	496,638	496,638
Multilateral development banks and international Organisations	0%	729,234	729,234
	Total	729,234	729,234
	2%	125,038	47
	20%	62,782,955	2,253,445
Institutions	100%	24,576	443
	Total	62,932,569	2,253,934
	20%	3,321,462	9,995
	100%	72,895	72,895
Corporates	150%	647	647
	Total	3,395,004	83,537
Exposures in default	150%	6,849	6,849
	Total	6,849	6,849
	0%	5	5
	100%	18,644	18,644
Other (including equity holding)	250%	31,646	31,646
	Total	50,295	50,295
Total 2019		73,774,025	9,734,967
Total 2018		61,218,731	12,883,345

* CRM (Credit Risk Mitigation techniques)

** CCF (Credit Conversion Factor)

Table 41. Total exposure by asset classes and risk weights (CBL)

Average exposure over the period (€' 000)

Exposure class	Exposure value before CRM* and CCF**
Central governments and central banks	7,118,016
Regional governments and local authorities	271,299
Public sector entities	338,976
Multilateral development banks	615,407
International Organisations	5,226
Institutions	57,682,200
Corporates	1,377,487
Retail	
Exposures in default	3,057
Equity exposures	22,650
Other	20,913
Total 2019	67,455,231
Total 2018	64,441,005

* CRM (Credit Risk Mitigation techniques)

** CCF (Credit Conversion Factor)

Table 42. Average exposure by asset classes and risk weights (CBL)

31 December 2019 (€' 000)

Exposure class	Risk weight	Exposure value before CRM* and CCF**	Exposure value after CRM* and CCF**
	0%	1,087,855	1,087,855
	20%	10	10
Central governments and central banks	50%	4	4
	100%	74	74
	Total	1,087,943	1,087,943
Regional governments, local authorities and other public bodies	0%	33,306	33,306
	Total	33,306	33,306
Institutions	20%	1,017,004	306,898
	Total	1,017,004	306,898
Corporates	100%	7,717	7,717
	Total	7,717	7,717
Retail	75%	9	9
	Total	9	9
Other	100%	12,403	12,403
	Total	12,403	12,403
Total 2019		2,168,624	1,458,518
Total 2018		2,455,615	1,488,582

** CCF (Credit Conversion Factor)

Table 43. Total exposure by asset classes and risk weights (CBF)

Average exposure over the period (€' 000)

Exposure class	Exposure value before CRM* and CCF**
Central governments and central banks	8,217,339
Regional governments and local authorities	300,797
Public sector entities	401,092
Multilateral development banks	615,556
International Organisations	15,499
Institutions	59,034,624
Corporates	292,906
Retail	403
Exposures in default	-
Equity exposures	25,540
Other	66,536
Total 2019	68,970,292
Total 2018	66,055,825

* CRM (Credit Risk Mitigation techniques)

** CCF (Credit Conversion Factor)

Table 44. Average exposure by asset classes and risk weights (CBF)

Most of Clearstream's exposures are towards central governments and central banks as well as institutions. As per year end 2019 most exposures to central governments and central banks are risk-weighted with 0%. The exposures to institutions mainly have only a short maturity of less than or equal to three months, thus, pursuant to Article 120 paragraph 2 CRR a risk weight of 20% can be applied.

Detailed information and distribution of credit risk exposures

In the following the distribution of the credit risk exposures is broken down by exposure classes, geographical areas and residual maturity according to Article 442 CRR.

As at 31 December 2019, the geographical distribution of credit risk exposures is as shown in the below tables.

31 December 2019 (€'000)

Exposure class	European Union	Rest of Europe	North America	Rest of World	Total
Central governments and central banks	7,188,463	34,398	733	6,110	7,229,704
Regional governments, local authorities and other public bodies	546,868	20	0	0	546,888
Multilateral development banks and international organisations	366,493	113	372,891	46	739,544
Institutions	38,139,352	25,666,110	525,279	1,893,893	66,224,635
Corporates	85,368	8,676	519	12,254	106,818
Retail	576	0	0	0	576
Other (including equity holding)	76,367	504	0	27,410	104,281
Total 2019	46,403,488	25,709,822	899,423	1,939,713	74,952,445
Total 2018	37,295,362	21,502,672	1,477,221	2,505,204	62,780,459

Table 45. Geographical breakdown of exposures (CH-Group)

31 December 2019 (€'000)

Exposure class	European Union	Rest of Europe	North America	Rest of World	Total
Central governments and central banks	6,121,116	34,053	1,918	6,351	6,163,438
Regional governments, local authorities and other public bodies	496,638	0	0	0	496,638
Multilateral development banks and international organisations	356,151	111	372,918	54	729,234
Institutions	59,161,156	1,290,634	514,481	1,966,298	62,932,568
Corporates	3,379,421	1,718	668	13,197	3,395,005
Exposures in default	1,884	4,858	19	88	6,849
Other (including equity holding)	22,145	0	0	28,149	50,295
Total 2019	69,538,511	1,331,374	890,004	2,014,137	73,774,026
Total 2018	54,873,863	2,025,748	1,721,286	2,597,835	61,218,731

Table 46. Geographical breakdown of exposures (CBL)

31 December 2019 (€'000)

Exposure class	European Union	Rest of Europe	North America	Rest of World	Total
Central governments and central banks	1,087,943	0	0	0	1,087,943
Regional governments, local authorities and other public bodies	33,306	0	0	0	33,306
Multilateral development banks and international organisations	10,240	0	0	0	10,240
Institutions	1,015,070	1,827	107	0	1,017,004
Corporates	7,392	297	8	20	7,717
Retail	9	0	0	0	9
Other	11,670	0	733	0	12,403
Total 2019	2,165,631	2,124	848	20	2,168,624
Total 2018	2,442,050	12,626	931	9	2,455,615

Table 47. Geographical breakdown of exposures (CBF)

The residual contract maturity, broken down by exposure classes is shown below.

31 December 2019 (€'000)

Exposure class	No more than three months	Up to one year	Over one year	Total
Central governments and central banks	7,229,704	0	0	7,229,704
Regional governments, local authorities and other public bodies	70,402	154,100	322,386	546,888
Multilateral development banks and international organisations	250,821	135,318	353,405	739,544
Institutions	65,953,191	271,044	401	66,224,635
Corporates	106,818	0	0	106,818
Retail	576	0	0	576
Other (including equity holding)	0	0	104,281	104,281
Total 2019	73,611,511	560,461	780,472	74,952,445
Total 2018	61,139,257	493,060	1,147,702	62,780,459

Table 48. Maturity of exposures (CH-Group)

31 December 2019 (€'000)

Exposure class	No more than three months	Up to one year	Over one year	Total
Central governments and central banks	86,676	0	6,076,761	6,163,437
Regional governments, local authorities and other public bodies	1	0	496,637	496,638
Multilateral development banks and international organisations	0	0	729,234	729,234
Institutions	1,278,159	0	61,654,409	62,932,568
Corporates	5,968	0	3,389,036	3,395,004
Exposures in default	6,849	0	0	6,849
Other (including equity holding)	37,203	0	13,092	50,295
Total 2019	1,414,856	0	72,359,169	73,774,025
Total 2018	59,931,177	270,899	1,016,655	61,218,731

Table 49. Maturity of exposures (CBL)

31 December 2019 (€'000)

Exposure class	No more than three months	Up to one year	Over one year	Total
Central governments and central banks	1,087,943	0	0	1,087,943
Regional governments, local authorities and other public bodies	263	20,002	13,042	33,306
Multilateral development banks and international organisations	0	0	10,240	10,240
Institutions	1,017,004	0	0	1,017,004
Corporates	7,717	0	0	7,717
Retail	9	0	0	9
Other (including equity holding)	0	0	12,403	12,403
Total 2019	2,112,937	20,002	35,685	2,168,624
Total 2018	2,352,169	56,013	47,418	2,455,615

Table 50. Maturity of exposures (CBF)

Value adjustments and provisions

In accordance with German GAAP, Clearstream assesses, at each balance sheet date, whether there is objective evidence that a financial asset is impaired. Only indications of impairment incurred at the balance sheet date resulting from past events and current economic conditions can be considered. Losses expected as a result of future events, no matter how likely, are not recognised. According to the policies of Clearstream and in line with sound banking practices and regulations, Clearstream makes value adjustments and provisions, when necessary and due to individual decisions.

Clearstream does not have any value adjustments and provisions for credit risk exposures at present, because it does not have any impaired assets.

Definition of past due

An exposure is classified as "past due" in case a counterparty has failed to make a payment when contractually due, when the debtor has exceeded an external limit communicated to him as well as when the debtor has utilised credit without prior consent. This definition is used likewise for regulatory and accounting purposes.

Definition of default or non-performing

According to Article 178 CRR a debtor is in default when either or both of the following conditions apply:

- The institution has material reason to consider that the obligor is unlikely to pay its (credit) obligations in full, without recourse by the institution to actions such as realising collateral (if held);
- The obligor is past due more than 90 successive calendar days on any material part of its overall credit obligation to the institution.

The definition of "impairment" used for accounting purposes is compliant with the definition of "default" outlined in Article 178 CRR.

Past due items and default or non-performing exposures

Pursuant to the below stated definitions, Clearstream had no past due items or defaults or non-performing exposures in its books at the reporting date or during the year under review.

5.10. Disclosure of counterparty credit risk (CCR) (Article 439 CRR)

Derivatives are only held at CBL to hedge against interest and foreign exchange risk. The derivative position includes forward foreign exchange contracts. As of 31 December 2019, the positions correspond to economic hedges and do not opt for IFRS9 hedge accounting for the Luxembourg entity. The dealings with interest rate or foreign exchange risks (measurement, assignment of internal capital and limits etc.) are described in detail in [Chapter 7.7](#).

In cases where a certain level of foreign exchange exposure, and therefore risk, is exceeded, the risk of each individual currency exposure should be hedged. For Clearstream, the level of materiality is expressed as 10% of consolidated EBITDA of the budget year to be hedged for each individual currency exposure. For the protection of Clearstream's budgeted interest income, the Treasury Section may hedge the budgeted interest income for up to 50% of the customer credit balances for the upcoming budget period(s) through approved hedging instruments.

Foreign exchange outright contracts hedging the foreign exchange risk are settled via Continuous Linked Settlement (CLS)³, to minimise settlement risk, and executed with counterparties only where a Credit Support Annex (CSA) is signed to mitigate credit risk resulting from market movement.

The Mark-to-Market Method pursuant to Article 274 CRR is used by Clearstream to calculate the exposure value for OTC derivative instruments and long settlement transactions. The original exposure thus obtained is the exposure value.

FX swaps are considered as funding or an investment vehicle for currencies where no or limited deposit market exists (overnight swaps) or to convert USD liquidity (overnight and/or term FX swaps) into EUR used to purchase/repo against highly liquid paper delivered to BCL serving as liquidity buffer.

As at 31 December 2019, Clearstream did not hold any credit derivatives on its books. Hence, the report does not include a table containing information in conjunction with Art.439 (g) and (h) CRR concerning credit derivatives.

The following table discloses a comprehensive view of the methods used to calculate CCR regulatory requirements and the main parameters used within each method for CH-Group.

	31 December 2019 (€' 000)	31 December 2018 (€' 000)
	Original Exposure Method	Original Exposure Method
Notional amount	2,192,274	3,389,724
Exposure	61,659	67,469
RWA	13,050	20,867

Table 51. Analysis of CCR exposure by approach

The next table provides a summary of CH-Group's CVA regulatory calculations.

	31 December 2019 (€' 000)		31 December 2018 (€' 000)	
	Exposure value	RWA	Exposure value	RWA
Total portfolios subject to the advanced method	-	-	-	-
All portfolios subject to the standardised method	61,659	1,786	67,469	861
Based on the original exposure method	-	-	-	-
Total subject to the CVA capital charge	61,659	1,786	67,469	861

Table 52. CVA capital charge

³ CLS (Continuous Linked Settlement): CLS is a global multi-currency settlement system that aims to eliminate foreign exchange (FX) settlement risk due to time-zone differences by settling both legs of an FX transaction simultaneously (payment vs. payment).

The following table discloses a breakdown of CCR exposures by exposure class and by risk weight.

		31 December 2019 (€' 000)	31 December 2018 (€' 000)
Exposure classes / Risk weights			
Institutions			
	20%	60,321	58,253
	50%	705	-
	100%	634	9,216
Total		61,659	67,469

Table 53. Standardised approach - CCR exposures by regulatory portfolio and risk

The following table provides an overview of the impact of netting and collateral held on exposures.

	31 December 2019 (€' 000)	31 December 2018 (€' 000)
		Derivatives
Gross positive fair value or net carrying amount	61,659	67,469
Netting benefits	-	-
Netted current credit exposure	61,659	67,469
Collateral held	-	-
Net credit exposure	61,659	67,469

Table 54. Impact of netting and collateral held on exposure values

5.11. Disclosure of equities not included in the trading book (Article 447 CRR)

Equities held in the non-trading book concern strategic participations in companies with business related to the business of Clearstream and a mandatory participation in the Society for Worldwide Interbank Financial Telecommunication (SWIFT), as CBL and CBF are some of the largest users of SWIFT. Due to the strategic alignment, no participation is held in order to make short-term profits (no trading intent).

As described in [Chapter 1.2.1](#), Clearstream holds participations in the following entities:

- REGIS-TR S.A.,
- REGIS-TR UK Ltd.,
- Ausmaq Ltd.
- LuxCSD S.A.,
- Clearstream Nominees Ltd.

Due to the conditions laid out in Art. 19 CRR, these entities are excluded from the scope of prudential consolidation of Clearstream Group. Therefore, these participations are held as equity in the non-trading book. Owing to the SWIFT constitution, CBL and CBF must hold a participation in SWIFT as well.

For valuation and accounting purposes the German GAAP according to the German Commercial Code (HGB) is relevant for CH-Group on a consolidated level and for CBF's equities in the non-trading book. According to the specifications of HGB, equities in the non-trading book are defined as long-term financial assets.

The following table considers all mentioned participations that are held as equities in the non-trading book:

	31 December 2019 (€' 000)	31 December 2018 (€' 000)
Fair value of investments	39,549	16,286
Balance sheet value	40,183	11,912
Total unrealised gains (losses)	-634	4,375
thereof total revaluation gains (losses)	-634	4,375
Amounts included in the original or additional own funds	0	0

Table 55. Equities in the non-trading book

Note: None of the participations is listed on any exchange.

5.12. Asset encumbrance (Article 443 CRR)

The disclosed figures are median values based on the reported quarter-end figures as required. The information is disclosed at the consolidated level of CH-Group.

31 December 2019 (€' 000)					
		Carrying amount of encumbered assets	Fair value of encumbered assets	Carrying amount of unencumbered assets	Fair value of unencumbered assets
		10	40	60	90
010	Assets of the reporting institution	5,762	0	21,903,362	0
030	Equity instruments	0	0	0	0
040	Debt securities	0	0	1,213,414	1,200,359
120	Other assets	0	0	20,637,206	0

Table 56. Encumbered and unencumbered assets

The fair value of the non-encumbered collaterals from collateralised placings is shown in the table below.

31 December 2019 (€' 000)			
		Fair value of encumbered collateral received or own debt securities issued	Fair value of collateral received or own debt securities issued available for encumbrance
		010	040
130	Collateral received by the reporting institution	72,376	8,575,932
150	Equity instruments	-	-
160	Debt securities	72,376	8,575,932
230	Other collateral received	-	-
240	Own debt securities issued other than own covered bonds or ABSs	-	-

Table 57. Collateral received

As there were no matching liabilities to the only source of encumbrance, no sources can be shown.

6. Management of operational risk

Operational risk is defined as the risk of loss resulting from inadequate or defective systems and internal processes, human or technical failure, from inadequate or defective external processes, from damage to physical assets as well as from legal risks that could arise from non- or inappropriate compliance with new or existing laws and regulations and all contractual commitments. Based on this definition, Clearstream identified the operational risk classes:

- Availability risk (e.g. technical infrastructure, facilities, staff);
- Service deficiencies (e.g. errors & omissions, supplier deficiencies, product flaws);
- Damage to physical assets (e.g. accidents, natural hazards, terrorism, sabotage);
- Legal offences and business practices (e.g. non-compliance with laws & regulation)

6.1. Strategy and process (Article 435 (1)(a) & Article 454 CRR)

The risk management process for operational risk follows the overall risk management process as presented in [Chapter 4.1.5](#). The described five steps of the risk management process are therefore applicable for operational risk as well. Operational risk represents a major risk class for Clearstream and is systematically managed and controlled. Clearstream decided to cover business needs and regulatory requirements through the same approach to the largest extent possible. Therefore, Clearstream follows an Advanced Measurement Approach (AMA) for calculating regulatory capital requirements for operational risk. Thus, Clearstream established a comprehensive framework and set of instruments meeting the requirements from both a regulatory and a business perspective.

Since having received regulatory approvals as of January 2008, CBL and CBF apply the AMA to calculate their capital requirements for operational risk. In October 2010, CH received BaFin's approval to use the approach at group level in the course of the introduction of the supervision on CH-Group level. CH-Group has used the Direct VaR model for AMA purposes since regulatory approval in Q1 2017.

6.2. Structure and organisation (Article 435 (1)(b) CRR)

The ultimate responsibility for operational risk management lies with the members of the Executive Boards of Clearstream, who are supported by different units and functions. Executive Boards appoint "Operational Risk Representatives" for their respective area with a direct reporting line to the respective member of the Executive Management.

The Operational Risk Representative is the key contact for both the employees in the respective organisational unit as well as for Clearstream Risk Management. They support their line management with all tasks regarding operational risk and are especially responsible for the collection of operational risk event data within their organisational unit. In addition to this, the Operational Risk Representatives take an active role in further developing operational risk tools and instruments.

Furthermore, it is the responsibility of line management to control operational risk within their area on a day-to-day basis. This includes the identification of suitable measures to mitigate operational risk and to improve the effectiveness and efficiency of the operational risk management.

Operational risk management is performed by Clearstream Risk Management and governed by the *Group Risk Management Policy*. Operational risk representatives and owners play a crucial role in identifying, assessing and monitoring operational risks. Finally, it is the responsibility of any single employee to support Clearstream Risk Management, line management and the Operational Risk Representative of their organisational unit regarding any operational risk matters.

6.3. Assessment (Article 435 (1)(c) CRR)

Operational risks are estimated and quantified using a Value-at-Risk concept. A key component of Clearstream's operational risk assessment is its internally developed operational risk model. The operational risk model combines a frequency distribution, that models the likelihood of the occurrence of loss events, with a severity distribution, that describes the size of operational losses, yielding in a loss distribution. The loss distribution allows Clearstream to estimate potential operational risks at different confidence levels.

As Clearstream has a unique business model, it is not sufficiently represented in any bank consortium or public database. Therefore, it has been decided to use external loss data as data input only where appropriate.

Operational risk capital is intended to represent the required risk capital for unexpected operational risk losses. As part of the AMA within Clearstream, a model for calculating operational risk capital requirements has been developed, based on the individual risk profile of the bank.

In line with common practice in other risk areas, capital requirements are calculated using the Value-at-Risk (VaR) concept. Based on a statistical analysis of relevant data, a loss distribution is determined, which enables calculation of the required figures.

The model has been designed to have the following properties:

- Capital requirements reflect the risk profile of Clearstream Group and individual group entities.
- Confidence levels can be adjusted according to the risk appetite of the bank.
- Incentives for proper risk management can be included into the model.
- Major risk drivers can be identified.
- Risk mitigation effects can be taken into account.

Operational risk can be differentiated according to the severity and frequency of losses. The general principles for operational risk management are as follows:

- All main risks are identified and continuously analysed regarding the expected or real effect on frequency and severity.
- For risks with low frequency but high severity, risk transfers are considered, for example, through insurance contracts.
- For risks with high frequency but low severity, risk reduction is considered, for example, by optimising processes.

6.4. Mitigation and control (Article 435 (1)(d) CRR)

As laid out in its risk strategy, Clearstream gives considerable attention to its risk mitigation process. The aim is to reduce the frequency and the severity of potential operational risk events. Clearstream's operational risk mitigation process has three cornerstones that are described in turn in the following sections:

- Internal Control System
- Business continuity planning
- An insurance programme

The operational risk mitigation process comprises several quality and control initiatives whose objective is to ensure that Clearstream's operations have sufficient controls to prevent any fraud or operational service deficiency. If an event of this kind occurs in Clearstream's operations, a thorough analysis is performed to be in the position to define measures to reduce the probability of recurrence.

6.4.1. Internal Control System

The Executive Boards of Clearstream have implemented an internal control system, designed to ensure the effectiveness and profitability of the business operations, prevent or detect financial loss and thus protect all its business assets. Clearstream's internal control system, an integral part of the risk management system, continuously developed and adjusted to reflect changing conditions. It comprises both integrated and independent control and safety measures. In 2018, Clearstream established the Control Assurance & Monitoring (CAM) function to further enhance the documentation and monitoring of the internal control system.

Internal Audit carries out risk-oriented and process-independent controls to assess the effectiveness and appropriateness of the internal control system.

6.4.2. Business Continuity Management

Because the unavailability of core processes and resources represents a substantial risk for Clearstream, and a potential systemic risk to the markets, Clearstream has implemented a comprehensive Business

Continuity Management (“BCM”) approach as a key mitigator of availability risk. The BCM organisation and key operational risks addressed by BCM processes are described in the following paragraphs.

6.4.2.1. BCM organisation at Clearstream

The business continuity function is responsible for the overall monitoring of Clearstream’s readiness to deal with incidents, emergencies and crises. Organisational roles, responsibilities and guiding principles are all documented in a formal *Business Continuity Management Policy*. Business continuity plans are developed by the individual organisational units as each unit is responsible for its continuity and operational resilience.

6.4.2.2. BCM arrangements

The implemented BCM arrangements aim to minimise the impact of the unavailability of key resources and address the unavailability of systems, workspace and suppliers, but also the loss of significant numbers of staff in order to ensure the continuity of the most critical operations.

6.4.2.3. Systems unavailability

Data centres are geographically distributed to form active centres, acting as backups of each other. Data is mirrored in real time across the data centres. The infrastructure is designed to ensure the online availability and integrity of all transactions at the time of a disruption.

6.4.2.4. Workspace unavailability

Dedicated backup facilities provide office space for mission critical staff in the event that an office location becomes unavailable. These backup facilities are always fully equipped and connected to the distributed data centres and are operational at all times. In addition, business transfer plans between Clearstream’s different operations locations can be used to mitigate workspace unavailability.

6.4.2.5. Staff unavailability

Business Continuity measures address the loss of significant number of staff, covering emergency scenarios and potential pandemics. Solutions are designed to ensure that the minimum staff and skills required are available outside the impacted location. Staff dispersal and business transfer plans between Clearstream’s different operations locations are employed such that, if one of these locations is impacted, mission critical activities can be continued by staff in other locations.

6.4.2.6. Supplier unavailability

Clearstream assures itself of the continuous provision of critical supplier services by a number of means, such as regular due diligence reviews of suppliers’ BCM arrangements, provision of services by alternative suppliers if possible and service level agreements, describing minimum service levels expected from suppliers and contingency procedures requirements.

6.4.2.7. Incident and crisis management process

Clearstream has implemented a group-wide incident and crisis management process that facilitates a coordinated response and rapid reaction to an incident or crisis in a controlled and effective manner. The process aims to minimise business and market impact, as well as enable a speedy return to regular business activity.

Incident Managers have been appointed in the respective business areas as single points of contact in case of incidents, emergencies and crises to ensure the appropriate response including escalation up to the Executive Boards and notification to customers and other relevant external parties.

6.4.2.8. “Real-life” simulation testing

Clearstream adopts a comprehensive and ambitious business continuity testing approach that simulates scenarios as close as possible to real-life situations while reducing associated risks and avoiding customer impacts. BCM plans are tested on a regular basis, at least annually and mostly unannounced.

BCM test results are validated against the following objectives:

- Functional effectiveness: validating all technical functionalities.
- Execution ability: staff must be familiar with and knowledgeable in the execution of BCM procedures.
- Recovery time: the functions in the scope of the BCM plans must be operational within the defined recovery time objective.

6.4.3. Insurance programme

Insurance is an additional tool used by Clearstream to mitigate the impact of operational risk. It aims to transfer risks above a certain threshold to third parties through a comprehensive insurance programme.

In order to achieve the optimum risk/benefit versus premium ratio, insurance policies are negotiated either through insurance brokers or directly with highly rated insurers to purchase tailor-made policies reflecting the specificities of our business.

Each major insurance cover is reviewed annually following the evolution of Clearstream's risk profile.

Although the risk mitigating effect of insurance policies is not considered in the Operational Risk capital model, the insurance program is an important measure for management purposes.

6.4.4. Stress testing

In order to achieve a better understanding of the largest risks and to help gauge the potential vulnerability to exceptional but plausible events and assess the impact on the capital, Clearstream Risk Management runs stress tests. The stress tests focus on plausible events considering the respective frequency of occurrence per risk scenario.

6.5. Monitoring and reporting

In order to monitor operational risks effectively, thresholds have been defined for key risk indicators ("KRI") and risk indicators ("RI"). If the observed value exceeds the threshold, an escalation process is initiated, i.e. an analysis/investigation is carried out by the operational risk representative or the risk owner.

Operational risk information is integrated into the regular overall risk management reporting, which is laid out in [Chapter 4.1.5.5](#).

Furthermore, Clearstream produces a summary report on the Internal Capital Adequacy Assessment Process (ICAAP) on an annual basis, which is reviewed by Compliance and Internal Audit. This report includes additional statistics and trend analyses of operational risk events, but also a summary of major changes to the operational risk model, concept and methodology, and quality improvements in operational risk management.

6.6. Disclosure on operational risk (Article 446 CRR)

As described in [Chapter 6.1.](#), the own funds requirement for operational risk under Pillar 1 are calculated by using the Advanced Measurement Approach as defined in Art. 321 to Art. 324 CRR. Therefore, not only own funds requirements have to be reported but also losses and recoveries, as well as, details regarding large loss events.

7. Management of market risk including interest rate risk of exposures on positions not included in the trading book

Market risk may result from currency, equity price or interest rate fluctuations.

7.1. Strategy and process (Article 435 (1)(a) CRR)

The risk strategy and risk management process for market risk follows the overall risk management process as presented in [Chapter 4.1.5](#). The described five steps of the risk management process is therefore applicable for market risk as well.

As national and international central securities depository Clearstream follows a restrictive investment policy. Clearstream is not involved in proprietary trading activities and does not maintain a trading book. Thus, Clearstream's investment activities, i.e. the placement of clearing members' cash collateral and the investment of Clearstream's own liquidity, are allocated to the non-trading book in accordance with the CRR.

As the leading principle, placements shall be collateralised to the extent possible. Direct security purchases shall be permitted if mismatch, interest rate risk and stop loss limits have been approved by the responsible Executive Board. Uninvested cash shall be deposited with central banks or be placed with several financial institutions to avoid concentration. Transactions in derivative instruments shall be allowed only for hedging purposes.

7.2. Structure and organization (Article 435 (1)(b) CRR)

Clearstream Treasury activities are governed by Deutsche Börse's *Group Treasury Policy* including limits and responsibilities. The processes are further detailed by Clearstream Banking's *Treasury Liquidity Management Policy* and *Treasury Investment Policy*.

The *Treasury Investment Policy* sets the frame for hedging future currency risk and net interest income. It includes the approved hedging instruments and the delegation of power for hedging.

Treasury performs daily cash and risk management within predefined limits. This includes the application of mitigating measures to reduce market risk if necessary. Treasury Middle Office monitors compliance with the limits on a daily basis.

7.3. Assessment (Article 435 (1)(c) CRR)

The market risks are calculated using statistical simulations under Pillar II (Monte Carlo simulation), and the calculations of Interest Rate Risk in the Banking Book (IRRBB) are measured using sensitivity analysis. Clearstream monitors currency and interest rate exposures by means of reports generated by the general ledger accounting system and its customer cash ledgers or the Treasury ledger.

7.3.1. Interest Rate Risk

The interest rate risk at Clearstream stems primarily from asset liabilities mismatch. The non-exhaustive list of positions under scope contain customer cash and its placement either secured (reverse repo) or unsecured (nostros or overnight placements), loros, FX swaps, FX forwards, coupons of fixed bonds, pension assets and liabilities. These positions need to be quantified and monitored.

For the protection of Clearstream's budgeted net interest income, the Treasury section may hedge the budgeted net interest income for up to 50% of the customer credit balances for the upcoming budget period(s) through approved hedging instruments.

7.3.1.1. Interest Rate Risk Limits

Clearstream's assets and liabilities are managed by Treasury to contain interest rate risk (IRR) within the limits established by the *Treasury Investment Policy*. In particular, due to the short-term nature of Clearstream's liabilities its asset side is structured accordingly. The close matching of investments and customer deposits ensures that Clearstream can control its IRR.

To manage and measure the IRR positions, an IRR limit shall be maintained. The IRR limit defines the maximum acceptable loss which can be caused by an adverse shift in the yield curve. IRR shall be calculated daily on the basis of the net present value of a predefined hypothetical yield change calculated for the remaining days to maturity.

Interest rate risk is calculated by Risk Management under Pillar II and checked against the allocated risk bearing capacity. The IRR calculation takes places on a monthly basis and it is reported to Executive Board quarterly.

7.3.1.2. Stop-Loss Limits

To identify unfavourable changes in market conditions a Stop-Loss limit has been established. The Stop-Loss limit defines the amount up to which the fair value of a portfolio can decline upon which a prompt review of the portfolio shall be conducted, and actions shall be implemented to reduce the interest rate risk sensitive position to cut further losses. The unrealized loss is calculated daily based on the yield difference between position yield and market yield over the remaining life to maturity.

7.3.2. Foreign exchange risk

Clearstream provides settlement and custody services in more than 40 different currencies. Amounts in currency transmitted to Clearstream by customers are registered on the respective customers' account(s) in that currency. The same is true for any withdrawal of funds by customers (for example, for settlement purposes or for custody payments).

Debits and credits of all customers in the same currency are held by the respective Clearstream legal entity at its cash correspondent banks (CCBs). Treasury analyses balances per currency as a basis for placings. Where there is a requirement to fund net currency credit facilities, such takings are always made in the relevant currency.

A limited amount of local currency is held on entity level as well as at CBL representative offices, to cover expenses. In addition, interest earned on currency placings above interest payable to customers on currency balances will cause small (generally long) currency positions.

Additionally, Clearstream provides foreign exchange services to its customers. Foreign exchange risk resulting from the execution of customer foreign exchange requests is covered daily in the foreign exchange market to remain within the approved limits set.

7.3.2.1. Foreign exchange Risk Limits

The residual foreign exchange positions are monitored against approved limits on a daily basis. Reports to the Executive Board are submitted in case of limit violations.

The *Treasury Investment Policy* defines the maximum open foreign exchange position allowed for all currencies. A report showing the foreign exchange positions in all currencies is produced daily. Treasury Middle Office unit (hierarchically independent from Treasury) controls the report and reports any overstepping against the limit to the Executive Boards.

	31 December 2019 (€' 000)				31 December 2018 (€' 000)			
	Mismatch/Portfolio limit		Interest Rate Risk (IRR)		Mismatch/Portfolio limit		Interest Rate Risk (IRR)	
	Exposure	Limit	Exposure	Limit	Exposure	Limit	Exposure	Limit
CBL Investment portfolio (Fixed and FRN)	1,228,613	2,500,000	26,977	72,000	1,526,807	2,500,000	26,639	92,000
CBF Investment portfolio (Fixed and FRN)	43,000	175,000	584	8,000	99,000	175,000	1,522	8,000
CBL MM portfolio	3,898,606	7,300,000	11,936	24,000	3,036,605	7,300,000	4,319	26,000
CBF MM portfolio	33,168	300,000	12	1,000	89,262	300,000	98	1,000

Table 58. Limits according to Treasury Policy

7.3.3. Stress testing

In order to achieve a better understanding of the largest risks, help gauge the potential vulnerability to extreme but plausible events and assess the impact on the capital, Clearstream Risk Management runs stress tests. The stress tests focus on extreme but plausible events based on historical simulations.

Additionally, in accordance with the BaFin circular 06/2019 (BA)⁴, Treasury computes and reports to BaFin the level of interest rate risk in its banking book (IRRBB). Further details on IRRBB are described in [Chapter 7.7](#).

7.4. Mitigation and control (Article 435 (1)(d) CRR)

Compliance with IRR and Stop-Loss limits shall be checked by the Treasury Middle Office. Limit breaches, if not properly explained and sanctioned by the manager responsible for the position, shall immediately be reported to the board members responsible for Treasury and Risk. Interest sensitive and stop-loss relevant positions may be closed to mitigate increased risk.

Forward foreign exchange transactions may be undertaken in anticipation of expected future exposures in foreign currencies to hedge the expected foreign exchange exposure resulting from CBL's budgeted USD based net interest income (NII). In 2019 an amount of EUR 103mn, representing USD 120mn equivalent, was hedged against USD as a material part of the net interest-based USD income. If a foreign exchange hedge is undertaken, testing of the effectiveness of hedging transactions is performed on a regular basis in compliance with IFRS 9.

7.5. Monitoring and reporting

As described in the limit sections, Treasury Middle Office, independent of the Treasury Front Office department, is responsible for monitoring compliance with limits and issues monthly reports to the Executive Board and to Group Risk Management. Limit excesses are monitored daily and are reported immediately to the Head of Treasury, to Group Risk Management, the Chief Compliance Officer of Clearstream and Clearstream's Executive Board Members. Credit limit violations are reported as well to the Head of Group Credit.

7.6. Disclosure exposures for market risk (Article 445 CRR)

In order to determine the own funds requirement for market risk under Pillar 1, Clearstream uses the Standard Approach as defined in Article 325 et seq. CRR. Clearstream reports its amount of foreign-exchange risk calculated as at 31 December 2019. Clearstream is neither subject to settlement risk nor commodities risk as defined in the CRR.

7.7. Disclosure exposures on interest rate risk on positions not included in the trading book (Article 448 CRR)

Clearstream identifies and measures interest rate risk on a regular basis.

Quarterly, in accordance with the BaFin circular 06/2019 (BA)⁵ starting from 2019 Q4 (after being exempted during 2019), Clearstream computes and reports to BaFin the level of interest rate risk in its banking book (IRRBB) and demonstrates that its regulatory capital is sufficient to withstand an unexpected parallel shift in the interest rate yield curve of ± 200 basis points. If this standard shock results in a potential decline of the net present value of its interest rate sensitive positions by more than 20% of the regulatory capital, the Supervisory Authority will take appropriate actions. As of 31 December 2019, Clearstream did not breach the mandated threshold.

⁴ BaFin Circular (BA) -Interest rate risk in the Banking book:
https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Rundschreiben/2019/rs_06-2019_ZAER.html

⁵ BaFin Circular (BA) -Interest rate risk in the Banking book:
https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Rundschreiben/2019/rs_06-2019_ZAER.html

Clearstream Holding AG, Frankfurt	31. December 2019 (€' 000)	31. December 2018 (€' 000)
Interest Rate Risk - Banking Book (IRRBB) as per BaFin Rundschreiben 09/2018 (BA)		
Base EVE (in EUR equivalent)	1,959,476	-
IRRBB based on parallel shift of the yield curve of +200bps	-10,819	-
IRRBB based on parallel shift of the yield curve of -200bps	3,257	-
Eligible own funds	1,559,506	-
IRRBB +200bps parallel shift as percentage of own funds	-0.69%	-
IRRBB -200bps parallel shift as percentage of own funds	0.21%	-

Table 59. Interest rate in the banking book (CH-Group)

Clearstream Banking S.A., Luxembourg	31. December 2019 (€' 000)	31. December 2018 (€' 000)
Interest Rate Risk - Banking Book (IRRBB) as per circular CSSF 16/642		
Base EVE (in EUR equivalent)	1,465,059	1,139,121
IRRBB based on parallel shift of the yield curve of +200bps	-18,822	-7,503
IRRBB based on parallel shift of the yield curve of -200bps	20,165	8,290
Eligible own funds	1,131,346	1,086,501
IRRBB +200bps parallel shift as percentage of own funds	-1.66%	-0.69%
IRRBB -200bps parallel shift as percentage of own funds	1.78%	0.76%

Table 60. Interest rate in the banking book (CBL)

Clearstream Banking AG, Frankfurt	31. December 2019 (€' 000)	31. December 2018 (€' 000)
Interest Rate Risk - Banking Book (IRRBB) as per BaFin Rundschreiben 09/2018 (BA)		
Base EVE (in EUR equivalent)	494,417	482,308
IRRBB based on parallel shift of the yield curve of +200bps	9,014	15,458
IRRBB based on parallel shift of the yield curve of -200bps	-6,338	-14,012
Eligible own funds	369,696	369,255
IRRBB +200bps parallel shift as percentage of own funds	2.44%	4.19%
IRRBB -200bps parallel shift as percentage of own funds	-1.71%	-3.79%

Table 61. Interest rate in the banking book (CBF)

8. Management of liquidity risk

Liquidity risk is the risk arising from the inability to meet short-term payment obligations in case of mismatches between liquidity needs and liquidity sources.

8.1. Strategy and processes (Article 435 (1)(a) CRR)

The aim of Clearstream's liquidity management is the ability to respond to daily, including intraday, changing customer net long/short cash balances. Customers maintain cash balances with Clearstream and may additionally draw on credit facilities (unconfirmed funds facility (UCF) and intraday technical overdraft facilities (i-TOFs)) as a result of their securities settlement activities.

As Treasury's investment strategy is driven by the cash amounts customers leave on their settlement accounts with Clearstream and strict mismatch limits are established to limit liquidity risk that may arise from Treasury investments. Funds must be invested with the objective to have sufficient liquid resources such as highly liquid collateral or investments readily available and convertible into cash to sustain liquidity risks under a wide range of potential stress scenarios including intraday.

8.2. Structure and organisation (Article 435 (1)(b) CRR)

As defined in Clearstream's *Liquidity Management Policy*, the liquidity management strategy is executed by Treasury Luxembourg/Singapore on a centralized basis combining liquidity from CBL, CBF and other Clearstream entities for which cash pooling arrangements are in place.

Within Clearstream, the liquidity management function is performed by Treasury. Treasury controls the liquid assets and has the following tasks and responsibilities:

- Ensure access to and control over Clearstream's liquid assets at all times,
- Ensure the availability and diversification of sufficient liquidity sources and
- Ensure the avoidance of an excessive currency mismatch.

Treasury is responsible for the monitoring of activities resulting from Clearstream's cash management, liquidity stress test results and liquidity indicators, and taking appropriate actions accordingly.

Clearstream Risk Management oversees the liquidity risk and supports Treasury with assessments, monitoring and reporting activities. In addition, the risk committees of Clearstream entities monitor and oversee those activities and make recommendations to the relevant Executive Boards.

8.3. Assessment (Article 435 (1)(c) CRR)

8.3.1. Key Liquidity Indicators

In line with regulatory standards, Clearstream has established a comprehensive set of liquidity indicators to detect critical developments early and initiate mitigating measures in time. In the following, the key liquidity indicators are outlined.

In order to identify potential liquidity shortfalls in advance, Clearstream implemented early warning triggers as well as recovery triggers for all Key Liquidity Indicators.

8.3.2. Liquidity Coverage Ratio (LCR)

The LCR ratio focusses on the resilience of the liquidity risk profile and requires Clearstream to hold an adequate stock of unencumbered high-quality liquid assets (liquidity buffer) that can be converted into cash easily and immediately in private markets to meet its liquidity needs (net liquidity outflows) within a 30 calendar day horizon. Regulation (EU) No 575/2013 (CRR) supplemented by Commission Delegated Regulation (EU) 2018/1620 with regard to liquidity coverage requirements for credit institutions set out the detailed rules for the calculation of the LCR.

In addition to the LCR, Treasury calculates and monitors additional internal liquidity ratios which ensure a more dynamic adaptation to a changing liquidity situation, and that the liquidity sources provide sufficient liquidity to cover peak customer end-of-day overdraft balances.

8.3.3. Stress testing

Clearstream uses scenario analysis as part of its regular stress testing in reference to the BaFin minimum requirements for risk management as defined in the MaRisk of 14 December 2012 (BaFin Circular 10/2012) and CSSF Circular 09/403 requiring that institutions conduct liquidity stress tests that enable them to assess the potential impact of extreme but plausible stress scenarios on their liquidity positions and their current contemplated risk mitigation.

In order to analyse the liquidity risk of Clearstream and to ensure that sufficient liquid financial resources are maintained at all times, comprehensive daily and quarterly stress test calculations are carried out. Clearstream has implemented various scenarios including market disruption and idiosyncratic events.

Three scenarios have been defined to stress liquidity risk:

Scenario 1 – Base scenario

The Base scenario takes into account the lowest net cash balances by currency in the most recent five-year time horizon.

Scenario 2 – Market Disruption scenario

The market disruption scenario considers a disruption in the macro economic environment. The assumption is that customer cash balances would drop by 10% (from their lowest historical five-year level), money market funding lines would decline by 50% and overdraft lines at CCBs/Depositories by 20%.

Scenario 3 – Idiosyncratic scenario

The market disruption / idiosyncratic scenario considers a disruption in the macro economic environment and a downgrade of Clearstream's credit rating. The assumption is that customer cash balances would drop by 30% (from their lowest historical five-year level), money market funding lines would no longer be accessible, and overdraft lines at CCBs/Depositories would decline by 60%.

Furthermore, additional scenarios simulate the default of major customers including their parent undertakings and subsidiaries, the default of a major service provider as well as a market disruption, and a downgrade of CBL's external credit rating.

8.4. Mitigation and control (Article 435 (1)(d) CRR)

§ 25a KWG in combination with Chapter BTR 3 'Liquidity Risk' of MaRisk require institutions to develop effective contingency plans considering the outcome of alternative scenarios.

Treasury is responsible for designing and monitoring a Funding Plan which includes a Contingency Funding Plan. In addition, the Recovery Plan includes such measures to strengthen the liquidity position in case of a breach of an early warning or recovery indicator.

Within those documents, a wide range of measures is outlined which may be initiated in case of a severe deterioration of its liquidity profile. Such measures include inter alia

- Intragroup funding;
- Cancellation of customer UCF/TOF lines;
- Liquidation of Clearstream's securities from Treasury activities.

Additional liquidity generation capabilities are available to face a contingency situation. They are not included in the three stress scenarios, which only include liquidity instruments used in the day-to-day liquidity management by Treasury.

8.5. Monitoring and reporting

Clearstream's liquidity risk exposure and breaches of limits are monitored and reported by the Treasury Middle Office. Reports are provided daily, weekly and monthly to Executive Board, Clearstream Risk Management and Treasury. Limit breaches occurring within the Treasury activity are reported by Treasury Middle Office to Executive Board.

Stress tests are calculated and reported on a regular basis by Risk Management. In case the liquidity stress tests result in a limit breach, Clearstream Risk Management (CRM) will report without delay to the respective Risk Committee and the relevant Executive Boards of Clearstream. Treasury, Credit, Product, Risk and the

responsible Risk Committee evaluate the result of the liquidity stress tests and agree on mitigating actions to follow including adjustments of the liquidity framework and updates of the contingency liquidity funding plan if needed.

The Executive Board is informed on a monthly basis about liquidity indicators, and on a quarterly basis, the Executive Board receives a comprehensive liquidity risk reporting.

8.6. Disclosure on Liquidity Coverage Ratio (LCR)

Institutions need to hold a liquidity buffer of high-quality liquid assets ("HQLA") to cover their net cash outflows in stressed conditions over a thirty-day period. The Liquidity Coverage Ratio is set at a minimum ratio of 100%.

31 December 2019

	High quality liquid assets (€' 000)	Total unweighted value	Total weighted value
1	Total HQLA	14,567,401	14,566,986
Cash outflows (€' 000)			
7	Non-operational deposits (all counterparties)	13,778,271	13,245,563
10	Additional requirements, of which:	1,928	1,928
14	Other contractual funding obligations	76,688	76,688
15	Other contingent funding obligations	337,450	19,583
16	Total cash outflows	14,194,336	13,343,762
Cash inflows (€' 000)			
17	Secured lending (eg reverse repos)	3,810,001	77,845
18	Inflows from fully performing exposures	1,622,074	1,583,958
20	Total cash inflows	5,432,075	1,661,803
Summary parameters			Total adjusted value
21	Total HQLA (€' 000)		14,566,986
22	Total net cash outflows (€' 000)		11,681,959
23	Liquidity Coverage Ratio (%)		124.70%

Table 62. Level and components of the Liquidity Coverage Ratio

Additionally, as of 31 December 2019, the LCR of CBL amounted to 118.73% (2018: 122.49%), and LCR of CBF amounted to 141.61% (2018: 139.00%).

Annex 1. Abbreviations

Abbreviation	Definition
ABS	Asset-Backed Security
AG	Aktiengesellschaft (German: stock company)
A-IRB	Advanced Internal Rating Based Approach
AktG	Aktiengesetz
AMA	Advanced Measurement Approach
ASL	Automated Securities Lending Programme
AV	Availability
BaFin	Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority)
BCBS	Basel Committee on Banking Supervision
BCL	Banque centrale du Luxembourg
BCM	Business Continuity Management
CAM	Control Assurance & Monitoring
CBAG	Clearstream Beteiligungs AG
CBJ	Clearstream banking Japan Ltd.
CBL	Clearstream Banking S.A.
CBLRC	Clearstream Banking S.A. Remuneration Committee
CCB	Cash Correspondent Bank
CCF	Credit Conversion Factor
CCP	Central Counterparty
CCR	Counterparty Credit Risk
CDO	Collateralised Debt Obligation
CEM	Current Exposure Method
CEO	Chief Executive Officer
CET1	Common Equity Tier 1
CGSS	Clearstream Global Securities Services Ltd.
CH	Clearstream Holding AG
CI	Clearstream International S.A.
CLN	Credit-Linked Note
CLO	Credit-linked Obligation
CLS	Continuous Linked Settlement
CMBS	Commercial Mortgage-Backed Security
COP	Clearstream Operations Prague s.r.o.
CP	Clearstream Participations S.A.
CRC	Clearstream Risk Committee
CRD IV	Capital Requirements Directive IV
CRD V	Capital Requirements Directive V
CRM	Clearstream Risk Management
CRO	Chief Risk Officer
CRR	Capital Requirements Regulation
CRR II	II Capital Requirements Regulation II
CS	Clearstream Services S.A.
CSA	Credit Support Annex
CSD	Central Securities Depository
CSDR	Central Securities Depository Regulation

CSSF	Commission de Surveillance du Secteur Financier
CVA	Credit Valuation Adjustment
DBAG	Deutsche Börse AG
DrittelbG	Drittelbeteiligungsgesetz
EaR	Earnings at Risk
EBA	European Banking Authority
EBITDA	Earnings before Interest, Tax, Depreciation, and Amortization
ECAI	External Credit Assessment Institution
ECB	European Central Bank
ECL	Expected Credit Loss
ECON	European Parliament's Economic & Monetary Affairs Committee
EC	European Commission
ECP	Euro Commercial Paper
EEA	European Economic Area
EMIR	European Market Infrastructure Regulation
ESMA	European Securities and Markets Authority
EU	European Union
F-IRB	Foundation Internal Rating Based Approach
FRN	Floating Rate Note
FRTB	Fundamental Review of the Trading Book
FSB	Financial Stability Board
FX	Foreign Exchange
GMRA	Global Master Repurchase Agreement
G-SIB	Global Systemically Important Bank
G-SII	Global Systemically Important Institution
GSF	Global Securities Financing
HQLA	High Quality Liquid Assets
IAS	International Accounting Standards
ICAAP	Internal Capital Adequacy Assessment Process
ICSD	International Central Securities Depository
IFRS	International Financial Reporting Standards
ILAAP	Internal Liquidity Adequacy Assessment Process
IMM	Internal Model Method
IRR	Interest Rate Risk
IRRBB	Interest Rate Risk in the Banking Book
KFH	Key Function Holder
KRI	Key Risk Indicators
KWG	Kreditwesengesetz (German Banking Act)
LCR	Liquidity Coverage Ratio
LGD	Loss Given Default
LOBP	Legal Offences and Business Practices
LSI	Less Significant Institution
Ltd.	Limited
MAS	Monetary Authority of Singapore
MBS	Mortgage-Backed Security
MEIP	Minimum Export Insurance Premiums
MREL	Minimum Requirement for own funds and Eligible Liabilities
NCSC	Non-Collective Safe Custody business

NII	Net Interest Income
NPV	Net Present Value
NSFR	Net Stable Funding Ratio
OECD	Organisation for Economic Cooperation and Development
OpRisk	Operational Risk
O-SIB	Other Systemically Important Bank
O-SII	Other Systemically Important Institution
OTC	Over-the-Counter
P2G	Pillar II Capital Guidance
PA	Damage to Physical Assets
PD	Probability of Default
PROFIL	Fédération des Professionnels du Secteur Financier
RBC	Risk-Bearing Capacity
REC	Required Economic Capital
RI	Risk Indicator
RMBS	Residential Mortgage-Backed Securities
RTS	Regulatory Technical Standards
RWA	Risk-Weighted Assets
S&P	Standard & Poor's
S.A.	Société Anonyme
SA	Standardized Approach
SD	Service Deficiency
SFT	Securities Financing Transactions
SI	Significant Institution
SREP	Supervisory Review and Evaluation Process
SRM-R	Single Resolution Mechanism-Regulation
SRP	Supervisory Review Process
SSM	Single Supervisory Mechanism
SSS	Securities Settlement System
STP	Straight-Through Processing
TLAC	Total Loss Absorbing Capacity
TOF	Technical Overdraft Facility
UCF	Unconfirmed Funds Facility
URF	Upon Receipt of Funds
VaR	Value at Risk

CBF	Trading book exposure						Own funds requirements			Own funds requirement weights	Countercyclical capital buffer rate	
	Exposure value for SA	Exposure value for IRB	Sum of long and short position of trading book	Value of trading book exposure for internal models	Exposure value for SA	Exposure value for IRB	Of which: General credit exposures	Of which: Trading book exposures	Of which: Securitisation exposures			Total
31 December 2019 (€' 000)	010	020	030	040	050	060	080	090	100	070	110	130
010 Breakdown by country												
Germany	6,862	0	0	0	0	0	549	0	0	549	34.08%	0.00%
France	23	0	0	0	0	0	2	0	0	2	0.12%	0.25%
Netherlands	50	0	0	0	0	0	4	0	0	4	0.25%	0.00%
Italy	3,471	0	0	0	0	0	278	0	0	278	17.25%	0.00%
Ireland	4	0	0	0	0	0	0	0	0	0	0.02%	1.00%
Greece	0	0	0	0	0	0	0	0	0	0	0.00%	0.00%
Spain	1	0	0	0	0	0	0	0	0	0	0.00%	0.00%
Belgium	4,001	0	0	0	0	0	320	0	0	320	19.88%	0.00%
Luxembourg	4,658	0	0	0	0	0	373	0	0	373	23.14%	0.00%
Lichtenstein	0	0	0	0	0	0	0	0	0	0	0.00%	0.00%
Austria	0	0	0	0	0	0	0	0	0	0	0.00%	0.00%
Switzerland	119	0	0	0	0	0	10	0	0	10	0.59%	0.00%
Kazakhstan	20	0	0	0	0	0	2	0	0	2	0.10%	0.00%
United Kingdom	178	0	0	0	0	0	14	0	0	14	0.88%	1.00%
United States	741	0	0	0	0	0	59	0	0	59	3.68%	0.00%
Cyprus	0	0	0	0	0	0	0	0	0	0	0.00%	0.00%
China	0	0	0	0	0	0	0	0	0	0	0.00%	0.00%
020 Total	20,130	0	0	0	0	0	1,610	0	0	1,610	100.00%	n.a.

Table 65. Geographical distribution of credit exposures relevant for the calculation of the countercyclical capital buffer (CBF)